CITIZEN WATCH IN THE ACCOUNTING DEPARTMENT?

TAX AND FINANCIAL REPORTING RESPONSES TO EMPLOYEE WHISTLEBLOWING ALLEGATIONS

A Dissertation

by

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ABSTRACT

This study examines the relation between employee whistleblowing allegations and firms' subsequent tax and financial reporting behavior. I draw on economic theory to develop expectations for and test firms' tax and financial reporting responses to whistleblowing reports of corporate financial misconduct. I employ a difference-in-difference research design to test whether firm's subject to employee whistleblowing allegations related to financial misconduct exhibit significantly less misreporting risk and tax avoidance in the period following the allegations relative to a control group of firms not subject to whistleblowing allegations.

Using a unique sample of whistleblowing cases obtained from the U.S. government, I find that firms subsequently engage in significantly less aggressive financial reporting behavior and have significant increases in their effective tax rates following whistleblowing allegations. This study contributes to the literature by providing evidence on firms' tax and financial reporting responses to employee whistleblowing and by highlighting the role that employees play in both tax and financial reporting oversight. In light of regulators' recently heightened emphasis on whistleblower programs, the results of this study should be of interest to regulators, researchers, auditors, and investors.

DEDICATION

I dedicate this work to my wife and sweetheart, Sarah Wilde, whose untiring support, encouragement, and love reflect so much of who she is: selfless, charitable, and noble; to my children, who are a joy and a blessing and who teach me more about who I need to become than I will ever teach them; and to my parents, whose examples and sacrifice in a large way motivated this pursuit in the first place.

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1. INTRODUCTION

In this study, I examine the relation between employee whistleblowing allegations related to financial misconduct and firms' subsequent tax and financial reporting behavior. Since the high profile accounting scandals at Enron, WorldCom, and Tyco, which cost investors billions of dollars and eroded confidence in published financial statements (Hobson et al. 2012), the U.S. Congress and federal regulators have instituted ambitious whistleblowing programs to reward and protect employees who expose tax and financial reporting misdeeds (Williams et al. 2012).[1] Regulators' heightened emphasis on these whistleblowing programs is notable in light of concerns about external parties' ability to effectively detect financial misconduct using publicly available information (e.g., Dyck et al. 2010; Hobson et al. 2012; PCAOB 2007). Recent research suggests that external monitors' proximity to a firm provides significant information benefits that help deter financial misconduct (Ayers et al. 2011; Kedia and Rajgopal 2011), which is consistent with the notion that managers are likely to engage in misconduct only when it is difficult for investors to detect it (Watts and Zimmerman 1986). Although employees lack formal authority to impose sanctions against a firm, their access to inside information makes them the primary actor in exposing financial wrongdoing (Dyck et al. 2010). Despite the significant role employee whistleblowers

[1] In this study, employee whistleblowing refers exclusively to employees alleging misconduct by the firm or its agents in financial matters (e.g., financial reporting, tax, securities laws, etc.).

play in monitoring and uncovering financial misconduct, we have limited evidence on how whistleblowing influences firms' subsequent tax and financial reporting behavior.

The objectives of this study are twofold. First, I draw on economic theory (e.g., Becker 1968) to develop expectations for and test firms' financial reporting responses to employee whistleblowing allegations. Economic models of wrongdoing (e.g., "crime") suggest that when managers perceive a higher likelihood of getting caught, they should be less likely to engage in financial reporting misconduct. I argue that by alleging financial wrongdoing to a party outside the firm, employee whistleblowing increases the probability of future external scrutiny (detection) and thereby increases the expected costs of misconduct. However, I also contend that whistleblowing is likely to have little effect on firms' subsequent reporting behavior if whistleblowing allegations are, on average, frivolous or if management believes that whistleblowing will not significantly influence the expected costs of the misconduct. For example, the SEC receives thousands of complaints each month and must use constrained resources to identify, investigate, and enforce legitimate cases. Thus, rational managers whose firms are engaged in misconduct likely evaluate the likelihood of an SEC investigation, even in the presence of a whistleblowing report, and potentially conclude that a given complaint is unlikely to considerably increase the expected costs of misconduct. Similarly, capital market pressures could influence firms to risk the potential increased scrutiny stemming from whistleblowing, especially if managers fear that sudden changes in financial reporting behavior might actually attract more scrutiny. In short, consistent with

economic theory, I expect changes in firms' financial reporting behavior subsequent to whistleblowing will be a function of the changes in the expected costs of the misconduct.

Second, I examine whether employee whistleblowing is associated with subsequent changes in firms' tax behavior. I argue that whistleblowing activity increases the costs of tax avoidance by (1) increasing the scrutiny of the firms' financial reports and the tax positions that affect financial reporting income; (2) increasing external party scrutiny (e.g., other regulators, the press) over financial activities generally, which in turn can trigger additional scrutiny from tax authorities; or (3) increasing the likelihood of scrutiny via tax-related whistleblowing activity.[2] However, I also note that even if whistleblowing increases the likelihood of scrutiny over tax activities, the significant uncertainty surrounding the magnitude of explicit or implicit penalties that might be levied against the firm for a given tax position suggests that whistleblowing could have little effect on firms' subsequent tax planning behavior. Further, management could perceive whistleblowing related to financial reporting to have little effect on the expected costs of tax planning. Thus, how whistleblowing affects firms' subsequent financial reporting behavior and firms' subsequent tax behavior are empirical questions.

Understanding firms' financial reporting and tax responses to employee whistleblowing allegations is important for at least two reasons. First, recent Congressional emphasis on employee whistleblowing programs at both the Securities and Exchange Commission (SEC) and the Internal Revenue Service (IRS) suggests a

[2] Whistleblowers can point external parties to the "soft points" in firms' tax positions (McCartney 2011), which can adversely affect firms' financial statements and increase firms' sensitivity to whistleblowing generally.

heightened reliance on whistleblowing activity to reduce aggressive reporting (IRS 2012; SEC 2012).[3] With significant increases in whistleblower activity (Williams et al. 2012), growing concerns that financial misconduct is on the rise (McCartney 2011), and arguments that "organizational complexity is now such that it is extremely difficult to uncover fraud without some help from within the company" (Zingales 2004), it is important to examine how whistleblowing affects subsequent tax and financial reporting behavior in order to better understand the potential effects of whistleblower programs.

Second, despite explicit whistleblower protection enacted in recent legislation, the considerable personal costs to employee whistleblowers in terms of reputation, job loss, economic benefits, and future employment (e.g., Call et al. 2012; Dyck et al. 2010) likely discourage legitimate whistleblowing efforts. As regulators face an uphill battle in securing needed resources to adequately protect investors (McCartney 2011) and as external monitors continue to struggle to detect misreporting (Hobson et al. 2012; PCAOB 2007), it is beneficial to assess the extent to which whistleblowing complements traditional monitoring mechanisms.[4] Thus, examining firms' tax and financial reporting

[3] The SEC now promotes whistleblowing as one of "the most powerful weapons in [its…] law enforcement arsenal," arguing that it helps the Commission to "identify possible fraud and other violations much earlier than might otherwise have been possible" (SEC 2012). The IRS emphasizes the growing role that whistleblowing plays in tax compliance and outlines the agency's plans for a comprehensive review of its Whistleblower Program (IRS 2012). Referring to its recent experience with whistleblower Bradley Birkenfeld, whom the IRS awarded $104 Million in connection with the UBS tax scandal, the IRS affirms that whistleblowing helps uncover information that it would not otherwise be able to detect (Rosenbaum 2012; Saunders 2012). Notably, from 2003 through 2010, the IRS awarded over $100 million to whistleblowers in connection with nearly $1.5 billion that it collected using whistleblower information (IRS 2007, 2010).

[4] As discussed later, whistleblowing is distinct from other avenues or signals of firm misconduct in several ways. For example, whistleblowers' access to inside information allows them to provide a roadmap (often with documentation) to the specific misconduct alleged, outlining a clear enforcement channel to regulators. Further, firms typically become privy to concerns of misconduct before it is revealed outside

responses to employee whistleblowing allegations is useful to regulators as they monitor increasingly complex organizations and grapple with growing whistleblowing programs, to researchers as they examine firms' reporting behavior, and to auditors and investors as they evaluate firm-level risks and investments.

To examine my research questions, I use a unique dataset of employee whistleblowing cases for the years 2004 through 2007, which were filed with the U.S. government because of discrimination complaints associated with whistleblowing related to financial wrongdoing.[5] I use propensity-score matching to assemble a control firm sample based on documented determinants of whistleblowing (Bowen et al. 2010). Then, using a difference-in-differences research design that controls for time invariant differences in whistleblowing ("treatment") and control firms as well as time trends common to both treatment and control firms, I investigate how firms subject to whistleblowing allegations subsequently change their financial reporting and tax avoidance behavior relative to control firms not subject to such allegations. Using this sample mitigates concerns that observed results are related to governance changes associated with restatements (Farber et al. 2005) or publicity associated with press coverage (Miller 2006).[6]

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the firm, providing them an opportunity to correct it before external parties become involved. Finally, other signals of potential misconduct (e.g., material weaknesses, qualified audit opinions, shareholder initiated lawsuits, etc.) suggest the possibility of misconduct well after the fact, whereas whistleblowing can provide timely information of what is occurring within the firm at a given time.

[5] The dataset includes all employee whistleblowing allegations filed because an employee alleges discrimination for voicing concerns of financial misconduct. In Section II, I describe the data and detail the whistleblowing process.

[6] Bowen et al. (2010) investigate and find no evidence of subsequent governance changes in firms subject to whistleblowing allegations reported to OSHA. In sections 4 and 6, I discuss controls for restatements,

The results suggest that firms subject to whistleblowing allegations engage in significantly less aggressive financial reporting (i.e., exhibit significantly less financial misreporting risk, Hobson et al 2012; Price et al. 2011) in the year following the allegations relative to matched control firms. I also find that following the allegations, firms subject to whistleblowing have significant increases in their three-year current and cash effective tax rates. The results of these analyses also suggest that the effect of employee whistleblowing on firms' subsequent financial reporting and tax avoidance behavior are economically significant. For example, firms subject to employee whistleblowing are associated with up to a .88 (.398) standard deviation decrease (increase) in misreporting risk (three-year effective tax rate) in the year following the allegations relative to firms not subject to such allegations. In supplemental tests, I find that the results are generally robust to alternative model specifications, estimation techniques and competing explanations including external monitoring, employee incentives, whistleblowing press coverage, and prior year misreporting.

This study contributes to the literature by providing evidence on firms' tax and financial reporting responses to employee whistleblowing allegations. Extant whistleblowing research examines the attributes of firms subject to whistleblowing, the stock market reactions to publicized allegations, and governance effects and economic consequences (future profitability after and stock market reactions) to such allegations (Bowen et al. 2010; Call et al. 2012; Dyck et al. 2010). In contrast, this study examines

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SEC enforcement actions, shareholder lawsuits related to financial reporting, and press coverage of whistleblowing allegations and results of tests suggesting that OSHA whistleblowing allegations which are also revealed in the press do not drive the results.

the specific tax and financial reporting decisions that flow from whistleblowing allegations, which is important given the heightened regulatory emphasis on whistleblowing programs. Second, this study highlights the indirect but integral role that employees play in tax and financial reporting oversight. While prior research emphasizes the role of *external* monitors on tax and financial reporting (Desai et al. 2007; Francis et al. 1999; Hoopes et al. 2012; Kinney et al. 2004; Xie et al. 2003), my results suggest that whistleblowing potentially increases management's perception of the likelihood of detection, which deters subsequent reporting misconduct. Third, this study contributes to the literature that examines the role of localized monitoring on financial reporting discretion (e.g., Ayers et al. 2011; Dyck et al. 2010; Kedia and Rajgopal 2011) by highlighting how managerial discretion in financial decisions is directly related to the costs of acquiring information about such misconduct. In particular, whistleblowers' access to inside information and ability to communicate information to external parties appears to significantly increases the expected costs of firms' subsequent misconduct. Finally, this study contributes to the literature that examines the relation between tax and financial reporting behavior (Erickson et al. 2004; Frank et al. 2009; Lennox et al. 2013; Robinson et al. 2010) by highlighting how whistleblowing is associated with subsequent changes in both tax and financial reporting behavior, consistent with expectations of increased scrutiny of financial activities generally.

The next section provides background on employee whistleblowing, Section 3 develops the hypotheses, and Section 4 describes the data and research design. Section 5 reports results, Section 6 discusses additional analyses, and Section 7 concludes.

2. BACKGROUND: EMPLOYEE WHISTLEBLOWING ALLEGATIONS

2.1 Employee Whistleblowing

Near and Miceli (1985, 4) define whistleblowing as "disclosure by organization members…of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to effect action." Employee whistleblowing has received considerable attention from regulators and the media in recent years after whistleblowers helped uncover accounting scandals at Enron and WorldCom and the Sarbanes Oxley Act of 2002 ("SOX", U.S. House of Representatives 2002) prescribed explicit employee whistleblower protections (Bowen et al. 2010). In particular, SOX (§806) outlaws retaliation against employees who reveal "questionable accounting or auditing matters," provides discrimination protection for such whistleblowers (Title 18 U.S.C., §1514A(a)(1)), and designates the U.S. Occupational Safety and Health Administration (OSHA) as the agency responsible for handling employee whistleblowing discrimination cases. Two more recent Congressional acts (the Tax Relief and Health Care Act of 2006, "TRHCA," (U.S. House of Representatives 2006) and the Dodd-Frank Act of 2010, "Dodd-Frank Act" (U.S. House of Representatives 2010)) continue to shape the whistleblowing environment for tax and financial reporting. Collectively, these acts suggest an increasing regulatory emphasis on employee whistleblowing programs.[7]

[7] TRHCA requires the IRS to establish a Whistleblower Office and provides whistleblowing incentives of up to 30 percent of the total proceeds (exceeding $2 million) that the IRS collects from misreporting

2.2 Employee Whistleblowing Data

Prior research uses two sources to identify firms subject to external employee whistleblowing allegations: the media ("press sample," Bowen et al. 2010; Call et al. 2012) and OSHA ("OSHA sample," Bowen et al. 2010). The press sample includes firms subject to whistleblowing that is publicized in the press. The OSHA sample includes whistleblowing cases that are filed with OSHA because an employee alleges firm retaliation (e.g., discrimination) for voicing concerns within the firm that some form of financial misconduct had occurred. The whistleblower could also have reported similar allegations to another external party. Bowen et al. (2010) use Freedom of Information Act requests to obtain information on all OSHA whistleblowing cases related to financial practices for the years 2002 through 2004. These allegations typically reflect aggressive or (in extreme cases) illegal financial activities (e.g., accounting irregularities, tax misreporting, securities law violations, fraud, etc.).[8, 9] As described in

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taxpayers. The Dodd Frank Act strengthens whistleblowing protections and provides whistleblowing incentives of 10 to 30 percent of the monetary sanctions collected via civil or criminal proceedings against wrongdoers. Robert Khuzami, chief of the SEC's enforcement division, suggests that following the act, the SEC has received considerably more whistleblowing tips (about 6 to 7 per day versus the 6 to 7 per year it received before the act via applications for whistleblowing remuneration), and notes that some are "of particularly high quality" (Patterson and Strasburg 2012). During the sample period of the study, financial awards were available to employee whistleblowers for both tax and financial reporting misconduct. OSHA whistleblowing cases are not explicitly eligible for financial rewards unless the employee also separately provided information to the IRS or SEC. Because employee whistleblowing allegations made to external parties other than the media or OSHA are not observable, it is possible that some firms that are subject to whistleblowing allegations are treated as non-whistleblower firms in the analyses. This works against finding evidence of significant changes in tax and financial reporting behavior relative to non-whistleblower firms.

[8] Bowen et al. (2010) note that *internal* whistleblowing involves individuals reporting potential misconduct to others within the firm (e.g., the internal audit department or management), whereas *external* whistleblowing occurs when individuals publicize an internal allegation or reveal information about the alleged misconduct outside of the firm. This study focuses on external whistleblowing because cases of internal whistleblowing are not typically observed outside the firm (Bowen et al. 2010) and changes in subsequent reporting behavior are likely to occur when management knows that employees have reported

Section 4.1, I use an updated sample of OSHA whistleblowing cases from 2004 through 2007.

2.3 The Employee Whistleblowing Process

Figure 1 illustrates the sequence of events for employee whistleblowing. The process begins when an employee voices concerns (within the firm) about potential financial improprieties. The firm can respond by addressing the concerns or perhaps by retaliating against the employee. In either case, the employee could decide to report the concerns to an outside party (e.g., to the press or other regulators). Further, employees who experience firm retaliation (for voicing the concerns) can file discrimination cases with OSHA. When OSHA receives a complaint from a whistleblower, it (1) notifies the firm of the allegation and provides a copy of the complaint, (2) schedules and conducts an investigation, and (3) sends copies of the whistleblowing allegations along with the findings of the investigation to other relevant regulators (e.g., to the SEC) (OSHA 2011). Regardless of the outcome of the discrimination investigation, OSHA sends the allegations to other regulators and retains the right to disclose its findings to the media.

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allegations of misconduct outside of the firm. Both the press and OSHA samples, which have some small overlap, are cases of external whistleblowing. In Sections 4 and 6, I discuss press coverage controls that I use in empirical tests and results when using only the OSHA cases.

[9] The OSHA whistleblowing cases come from each of the 10 OSHA regions nationwide. When a firm is subject to more than one allegation in the sample period (e.g., in more than one year), I only use the first OSHA whistleblowing case in the sample to prevent repeated "treatments" of the same whistleblowing firm. Unfortunately, in many instances, the cases provide little detail on the specific nature of the allegations. For more than 50 percent of the cases, the nature of the allegation is not clear either because the language used in the detail provided by OSHA is vague (e.g., "fraud" with no description of the type of fraud involved—tax, financial reporting, etc.) or not provided by the OSHA office at all. OSHA also redacts the name and position of the whistleblower in order to preserve confidentiality. Thus, it is difficult to assess how substantive the allegations are (especially in terms of economic magnitudes) or whether they involve illegal acts. However all cases reflect discrimination complaints filed with OSHA because the employee alleges retaliation by the firm because the employee voiced concerns (within the firm) about financial misconduct.

Following the allegations, the firm potentially changes its tax and financial reporting behavior in response to a perceived increase in the likelihood of future scrutiny; such changes are the focus of this study.

Whistleblowing to OSHA is distinct from other avenues or signals of firm misconduct in several ways. For example, in cases of misconduct in which a whistleblower is not involved, the firm is unlikely to suspect that regulators are increasing scrutiny of the firm until after such regulators have initiated inquiries and/or investigations into firm behavior. In most whistleblowing cases (and in all OSHA whistleblowing cases), firms become privy to concerns of misconduct before the whistleblower relays the information to an external party. Further, whistleblowers' access to inside information allows them to provide a roadmap (often with documentation) to the specific misconduct alleged, providing a clear enforcement channel to regulators. Without inside information, regulators either need to investigate all activities (which is infeasible) or use constrained resources to investigate areas that are most likely to involve misconduct (which is likely less efficient than investigating whistleblower tips). Finally, other signals of potential misconduct such as material weaknesses, qualified audit opinions, shareholder initiated lawsuits, etc. suggest the possibility of misconduct well after the fact; however, whistleblowing can provide timely information of what is occurring within the firm at a given time. The ability of whistleblowers to identify and reveal misconduct in a timely manner is important in light of evidence that most serious cases of financial misconduct begin small and snowball into large-scale impropriety (Schrand and Zechman 2012).

2.4 Prior Whistleblowing Literature

Despite considerable media and regulator interest in whistleblowers, the archival whistleblowing literature in accounting and finance is relatively sparse. Bowen et al. (2010) examine employee whistleblowing cases and find that firms subject to whistleblowing that is revealed in the press experience an immediate negative stock market reaction, are subsequently more likely to restate earnings (presumably associated with periods before or around the allegation period), and experience more shareholder lawsuits and governance changes. They also find that firms subject to public employee whistleblowing exhibit relatively weaker future profitability and stock market performance. Call et al. (2011) examine the effect of stock option grants on whistleblowing activity and find that firms that grant more rank and file stock options are less likely to be subject to employee whistleblowing.

Dyck et al. (2010) examine which monitors (e.g., auditors, analysts, investors, short sellers, clients & suppliers, financial market regulators, non-financial market regulators, employees, lawyers, or the media) are most successful in uncovering financial misdeeds. They find that in their sample of fraud cases from 1996 to 2004, employee whistleblowers uncover the greatest number of misreporting cases. In related work, Miller (2006) examines the monitoring role of the press and finds that the business press helps uncover accounting misconduct, whereas the nonbusiness press tends to report on misconduct uncovered by others (e.g., auditors, law firms, or analysts). Finally, Baloria et al. (2011) find that firms with relatively weaker internal whistleblowing programs were significantly more likely to lobby against the whistleblowing program

proposed in the Dodd Frank Act. This study extends the whistleblowing literature by examining firms' tax and financial reporting behavior subsequent to whistleblowing.

3. HYPOTHESES

3.1 Financial Reporting Aggressiveness

Becker (1968) frames wrongdoing as a function of expected costs and benefits. The model suggests that the expected cost of financial misconduct is a function of the probability of detection and the expected penalty associated with the detection. Thus, deterrence is the underlying mechanism in the model: a higher probability of getting caught is associated with a lower likelihood of financial misconduct.

Because many managerial actions are rarely observed outside the firm, management's ability to perpetrate financial misreporting is contingent on concealing it from *external* parties, who in light of concerns of managerial opportunism (Jensen and Meckling 1976), closely monitor firm behavior. Accordingly, a considerable literature examines how different external parties mitigate aggressive financial reporting behavior.[10] Still, recent work highlights that with the increasing complexity of firms (Zingales 2004), external parties are woefully unsuccessful at identifying financial misconduct using publicly available information (e.g., Hobson et al. 2012; PCAOB 2007). In contrast, Dyck et al. (2010) find that access to inside information is associated with a 15 percent higher likelihood of uncovering financial wrongdoing. Their results suggest that "while an employee might gain much less than [other market participants]

[10] For example, prior studies suggest that sell-side analysts (Yu 2008), institutional investors (Chung et al. 2002), auditors (Becker et al. 1998; Francis et al. 1999), independent and financial-expert board members (Klein 2002; Xie et al. 2003), short sellers (Desai et al. 2006), and the SEC (Jennings et al. 2011; Kedia and Rajgopal 2011) monitor aggressive financial reporting behavior.

from revealing a fraud, he [or she] also faces a much lower cost (in fact, often no cost) in discovering it" (pg. 2214, parentheses as in original).

In their own right, employees pose little risk to managers engaging in financial misreporting: they have no authority to enforce appropriate reporting behavior. Unlike other local monitors such as auditors institutional owners, or regulators (Ayers et al. 2011; Becker et al. 1998; Kedia and Rajgopal 2011), who have specific mechanisms by which they can impose penalties against a firm (e.g., via audit opinions, restatements, market penalties, managerial discipline, or regulatory sanctions), whistleblowers' unique monitoring effectiveness stems from their ability to provide information about misconduct to external parties. Indeed, among the set of potential monitors, employees have the best access to information and management can perpetrate little (if any) financial misconduct without several employees knowing about and often supporting it (Dyck et al. 2010).[11] Thus, although employees cannot impose direct penalties against a firm, they can uncover and expose financial misconduct to external parties, who can then levy (implicit or explicit) penalties against the firm (e.g., Bowen et al. 2010).[12]

Notwithstanding the increased probability of external scrutiny, it is unlikely that employee whistleblowing allegations will have a significant effect on firms' subsequent

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[11] The significant potential personal costs of whistleblowing likely strengthen the credibility of whistleblowing allegations. For example, Dyck et al. (2010, 2216) report that in 82 percent of cases that they can identify, the whistleblowers allege that they quit under duress, were fired, or had significantly different responsibilities following the allegation. Many indicated, "If I had to do it over again, I wouldn't." One law firm that provides whistleblower services suggests that the costs of whistleblowing potentially include retaliation and/or distancing from one's former colleagues and friends, personal attacks on one's characters, and needing to change one's industry and/or career (Dyck et al. 2010). In light of these costs, prior research suggests that monetary awards (Bowen et al. 2010; Dyck et al. 2010) or intrinsic motivations such as duty (i.e., as a concerned citizen), pre-emptive self-defense or even spite (Gobert and Punch 2000) can motivate legitimate whistleblowing efforts. However, frivolous allegations can be used to secure protected "whistleblower" status to avoid termination (Schmidt 2005) or be used by employees who have an "axe to grind" (Gobert and Punch 2000, 63).

[12] Anecdotal evidence suggests that in even the most egregious and well-executed accounting scandals, employee whistleblowers successfully discover and expose financial improprieties (e.g., Cynthia Cooper at WorldCom and Sherron Watkins at Enron).

reporting behavior if whistleblowing allegations are, on average, frivolous or if management believes that whistleblowing will not significantly increase the expected costs of the misconduct.[13] For example, the SEC receives thousands of complaints each month and must use constrained resources to identify, investigate, and enforce legitimate cases. Notably, in the 30 years from 1976 to 2006 the SEC only brought 788 enforcement actions against firms engaged in financial misconduct, which is significant when one considers that some 17,000 registrants file quarterly reports with the SEC each year. Thus, rational managers whose firms are engaged in misconduct likely evaluate the likelihood of an SEC investigation, even in the presence of a whistleblowing report, and potentially conclude that a given complaint is unlikely to considerably increase the expected costs of misconduct. Similarly, capital market pressures could be such that firms are willing to risk the potential increased scrutiny stemming from whistleblowing, especially if managers fear that significant changes in financial reporting behavior might actually attract more scrutiny. Indeed, Jensen (2005) suggests that managers can rationalize financial misconduct despite the considerable potential costs to themselves and to shareholders. In short, consistent with economic theory, to the extent that the expected benefits of the misconduct exceed the expected costs of such misconduct—accounting for whistleblowing—firms are unlikely to change their financial reporting behavior.

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[13] Some evidence suggests that whistleblowing allegations in some contexts can be frivolous (*Economist* 2006) or used to secure protected "whistleblower" status to avoid termination (Schmidt 2005). The SEC now promotes whistleblowing as one of its most powerful enforcement tools (SEC 2012). Because regulators have incentives to promote whistleblowing too both enhance their enforcement efforts and justify budget requests, as whistleblower rewards become increasingly publicized, it is likely that that whistleblowing activity will become increasingly frivolous as individual seek to secure monetary benefits.

Still, I argue that external whistleblowing allegations likely increase management's perceptions of the likelihood of scrutiny by external parties, which significantly increases the expected costs of the misconduct. Consistent with economic theory, I expect that in light of the significant personal, financial, and reputational costs faced by managers of firms found to have engaged in financial misdeeds (Karpoff et al. 2008a,b),[14] employee whistleblowing allegations increase the expected costs of misconduct such that firms become subsequently less aggressive in their financial reporting. This leads to the following hypothesis (stated in alternative form):[15]

H1: In the year following employee whistleblowing allegations, firms are associated with less financial reporting aggressiveness relative to firms not subject to such allegations.

3.2 Tax Avoidance

Allingham and Sandmo (1972) extend Becker's (1968) model to a tax context and suggest that tax misreporting should be a function of both the probability of detection and the penalties associated with such detection. In this economic model, as with financial misreporting, deterrence is the underlying mechanism governing tax reporting behavior: as the likelihood of detection increases, the extent of risky tax avoidance decreases.[16]

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[14] Karpoff et al. (2008a) find that reputational market penalties alone account for several times the market value that the firm misleadingly inflates via misreporting. Karpoff et al. (2008b) find that managers of firms subject to SEC enforcement actions face considerable reputational and financial penalties including termination, future employment restrictions, firm ownership, SEC fines, and criminal jail sentences.

[15] I make a directional prediction because although there are reasons why one would expect no change in a firm's subsequent reporting behavior (i.e., the expectation under the null hypothesis), it seems unlikely that a firm would engage in relatively more financial reporting aggressiveness in consequence of whistleblowing allegations.

[16] Allingham and Sandmo (1972) model tax evasion from an individual taxpayer's perspective. As Hanlon and Heitzman (2010) note, many of the factors in the individual framework also apply in the corporate setting. For example, framing the expected costs of detection as a function of the probability of detection and penalties upon detection applies to the corporate setting. Because of separation of ownership and control, recent work has examined the implications of corporate tax avoidance from an agency perspective

There are three avenues by which whistleblowing can deter subsequent tax avoidance: (1) increasing the scrutiny of the firms' financial reports and the tax positions that affect financial reporting income (2) increasing external party scrutiny (e.g., other regulators, the press) over financial activities generally, which in turn can trigger additional scrutiny from tax authorities, or (3) increasing the likelihood of scrutiny via tax-related whistleblowing activity.

Consistent with evidence of a positive relation between aggressive financial reporting and tax avoidance behavior in certain contexts (e.g., Frank et al. 2009; Wilson 2009; Lennox et al. 2013; Lisowsky 2010), whistleblowing related to financial reporting issues could also be associated with changes in tax behavior because increased scrutiny of financial reporting information is likely associated with increased scrutiny of tax positions that affect financial income. Deloitte (2011) reports that "[a]ccounting for income taxes continues to be on the SEC's agenda when discussing critical matters and is *one of the top areas of focus in its reviews of public company financial filings*" (emphasis added). With concerns that tax accruals and deferrals continue to be the single largest area of U.S. GAAP failures (e.g., material weaknesses, Deloitte 2011) and a significant driver of restatements (Cheffers et al. 2011), external parties including the SEC will likely give more scrutiny to tax positions when there are concerns (such as whistleblowing allegations) of financial reporting misconduct.

(e.g., Slemrod 2004; Chen and Chu 2005; Crocker and Slemrod 2005). Slemrod (2004) suggests that managers' private interests potentially affect corporate tax behavior. To the extent that managers view whistleblowing allegations as potentially threatening their employment or reputation, especially if the allegations are subsequently validated by regulatory actions (e.g., IRS audit and penalties), they likely influence managers' subsequent tax behavior.

Whistleblowing (whether related to taxes or other financial issues) to an outside party potentially increases the likelihood of allegations either being publicized (e.g., via the press) or reported to other monitors (e.g., IRS, SEC etc.) by employees and/or other regulators, which could trigger increased scrutiny from tax authorities.[17] For example, when an employee alleges financial misconduct to an outside party, management does not know whether it is an isolated event or signals broad discontent or collusion among various employees in the accounting department—the so-called cockroach analogy, which suggests that seeing one cockroach likely signals a host of others. The notion that whistleblowers can go unnoticed for long periods of time as they collect evidence of misconduct (Eaglesham and Siconolfi 2011) only amplifies these concerns. Thus, to the extent that employee whistleblowing increases the likelihood of external scrutiny, it likely deters subsequent tax misconduct.

Finally, employee whistleblowing also raises concerns that employees can provide regulators with a "road map to the soft points" in uncertain tax positions (Williams et al. 2012), which can affect financial reporting income. When Fortune 500 firms alone account for some $200 billion in uncertain tax positions and few firms are free from uncertainties surrounding valuations, economic substance, and/or transfer pricing issues (Williams et al. 2012), even firms that are not engaged in explicitly aggressive tax activities are likely to be concerned about increased scrutiny over financial reports and the tax positions that affect financial reporting income. Law firms

[17] By protocol, OSHA sends copies of whistleblower allegations to relevant regulators (e.g., the SEC) and federal law allows the SEC to share whistleblowing information with other regulators (15 U.S.C. 78u-6).

seeking business from prospective whistleblower clients fuel this concern. For example, Williams et al. (2012) note one law firm advertisement that points potential whistleblowers to "details in the tax accrual work papers [which] often make for valuable tax whistleblower submissions."[18]

Still, there are also several reasons why whistleblowing could have a limited effect on firms' subsequent tax avoidance. For example, even if whistleblowing increases the likelihood of additional scrutiny, there is often significant uncertainty as to the magnitude of explicit or implicit penalties that could be levied against a firm for a given tax position.[19] Further, because tax avoidance increases after-tax cash flows, management could be less concerned about penalties imposed by investors. Although Hanlon and Slemrod (2009) document a small negative stock market reaction to press revelations of tax shelter activity, they acknowledge various factors that could be driving investors' responses to that news and Gallemore et al. (2012) find no evidence of subsequent changes in tax reporting behavior following such press coverage. Similarly, management potentially views whistleblowing related to financial reporting as having little effect on the expected costs of a firm's tax activities, even if such activities can affect financial reporting outcomes. Thus, it is not certain that whistleblowing will increase management's expected costs of uncertain tax positions such that they will subsequently engage in less tax avoidance.

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[18] Because employee whistleblowing allegations likely affect subsequent tax avoidance behavior generally (whether due to innate aggressiveness or uncertainty in broad tax planning), I am interested in tax avoidance, or the "reduction of explicit taxes" (Hanlon and Heitzman 2010, 137) rather than "tax aggressiveness" *per se*.

[19] Graham and Tucker (2006) highlight that in even extreme cases of tax avoidance (e.g., their sample of tax sheltering firms), the final outcome of the tax treatment for a given position can go in favor of the firm.

Notwithstanding these arguments, I expect that the whistleblowing likely increases the expected costs of tax avoidance such that firms engage in less tax avoidance in the period following whistleblowing allegations. Formally stated, I propose the following hypothesis (stated in alternative form):

> *H2: In the period following employee whistleblowing allegations, firms are associated with lower tax avoidance relative to firms not subject to such allegations.*

4. DATA AND RESEARCH METHOD

4.1 Data

To examine my research questions, I use a sample of firms subject to employee whistleblowing allegations filed with OSHA for the years 2004 through 2007.[20] This sample offers three advantages. First, because the OSHA cases are known to the firm, but (relative to a press sample) are less likely to be broadly publicized (Bowen et al. 2010), using this dataset mitigates concerns that observed effects reflect broad publicity of the allegations, rather than the employee whistleblowing activity itself. Second, prior research investigates and finds *no* evidence that firms subject to employee whistleblowing allegations (reported to OSHA) are associated with subsequent governance changes (Bowen et al. 2010), which mitigates concerns that observed results in my tests could be due to governance changes that also influence reporting behavior. Finally, the OSHA sample reflects both whistleblowing allegations and discrimination complaints associated with such allegations, which adds tension to the research question. For example, if managers expect that discrimination against employee whistleblowers will deter future whistleblowing, they could be less likely to change tax and financial

[20] I use data from 2003 through 2010 (i.e., to match in *t-1* and assess firms' *subsequent* responses to whistleblowing allegations as described below). Financial and short interest data are from Compustat; restatement data is from Audit Analytics; institutional ownership data is from Thomson Reuters; accounting and fraud risk measures are from Audit Integrity; analyst data is from I/B/E/S; and stock market data is from CRSP.

reporting behavior out of concern for whistleblowers revealing misconduct in the future.[21]

4.2 Research Method

I use a difference-in-differences design (Altamuro et al. 2005) to investigate how firms' tax and financial reporting behavior changes subsequent to whistleblowing. The difference-in-differences approach mitigates concerns that either time trends in tax and financial reporting behavior of similar firms or time-invariant differences between whistleblowing and control firms drive the observed results (Roberts and Whited 2012). To begin, I follow Bowen et al. (2010) to estimate the following logistic regression model, which I use to assemble a propensity-score matched sample of control firms based on documented whistleblowing determinants.[22]

$$Pr(Whistleblowing)_{i,t} = \beta_0 + \beta_1 CM\_PRESSURE_{i,t-1} + \beta_2 GROWTH_{it-1} + \beta_3 PAST\_PERF_{it-1} + \beta_4 REPUTATION_{it-1} + \beta_5 COMMUNICATION_{it-1} + \beta_6 DOWNSIZE_{it-1} + \beta_7 QUITAM_{it-1} + \beta_8 SIZE_{it-1} + \beta_9 ICW_{it-1} + \beta_j INDUSTRY + \varepsilon, \quad (1)$$

[21] Because employee whistleblowing allegations made to external parties other than the media or OSHA are not observable, it is possible that some firms that are subject to whistleblowing allegations are treated as non-whistleblower firms in the analyses. This works against finding evidence consistent with the hypotheses. For example, if a whistleblower alleges misconduct directly to another party (e.g., the SEC instead of OSHA) and the firm responds by engaging in relatively less financial reporting aggressiveness and tax avoidance, then treating such firm as a *non-WB* firm reduces the power of the tests to detect a significant difference in *WB* firms' reporting responses to the allegations.

[22] The propensity-score matching approach mitigates selection concerns associated with the non-randomness of whistleblowing activity (Bowen et al. 2010). I follow Bowen et al. (2010) to use the modified version of their original model in order to maximize the number of observations available for the matching process. In Section 6, I discuss analyses I conduct to assess the effect of this design choice on the results (e.g., external monitoring tests). I thank Andy Call for providing whistleblowing determinants data.

Where *PR(Whistleblowing)* reflects the probability of being subject to a whistleblowing allegation and the independent variables (whistleblowing determinants) include measures of capital market pressure (*CM PRESSURE*), growth (*GROWTH*), past performance (*PAST_PERF*), firm reputation (*REPUTATION*), unclear communication channels (*COMMUNICATION*), employee downsizing (*DOWNSIZE*), membership in an industry with monetary incentives to report wrongdoing (*QUITAM*), firm size (*SIZE*), and internal control weaknesses (*ICW*) (all variables are described in the Appendix and are measured consistent with Bowen et al. 2010).[23]

I match each firm that is subject to whistleblowing allegations filed with OSHA (*WB* firm) to the control firm (*non-WB* firm) with the nearest propensity to be subject to whistleblowing as of the year prior to the whistleblowing event.[24] *WB* is coded as 1 for all observations of firms subject to whistleblowing allegations at any point in the sample period and 0 for all control firms, which are never subject to whistleblowing allegations (whether to OSHA or as revealed in the press) during the sample period. The time period of interest in all tests is the year following the whistleblowing allegation (*POST*). Notably, the *WB* firm and its matched control firm have the same values for *POST* in the same years (i.e., *POST* is an indicator variable of 1 for *WB* firm observations in the year after the whistleblowing allegation; 1 for control firm

[23] Because my interest is in the effect of the external whistleblowing allegations (rather than accusations of misconduct voiced within the firm), using the propensity-score matched sample is important because control firms matched on documented whistleblowing determinants potentially had internal whistleblowing allegations that were resolved within the firm (or were taken directly to the SEC or IRS, who likely do not notify the firm of the allegation unless they begin an investigation), while the treatment firms are subject to external whistleblowing to OSHA, which promptly notifies the firm of the allegation.

[24] Employees only have 180 days from the date of the alleged discrimination to file discrimination complaints related to whistleblowing activity on financial issues covered by SOX (OSHA 2011), which mitigates concerns of a significant time gap between the period of the financial misconduct and the discrimination file date.

observations in the year after the whistleblowing allegation of the matched *WB* firm; and 0, otherwise).[25]

4.3 Financial Reporting Aggressiveness

H1 posits a negative association between employee whistleblowing allegations and subsequent financial reporting aggressiveness. Although the literature proposes various measures of accounting quality (see Dechow et al. 2010 for a review), my objective is to assess firms' aggressive financial reporting behavior subsequent to employee whistleblowing allegations. Accordingly, I use three measures that prior research documents as being most associated with aggressive financial reporting in the form of misreporting risk (i.e., the risk of the financial statements being misstated): (1) the mapping of current, past, and present cash flows into accruals ("*AQ*," Dechow and Dichev 2002 as modified by McNichols 2002); (2) accounting risk ("*ACCT RISK*," Audit Integrity); and (3) fraud risk ("*AGR*," Audit Integrity). *ACCT RISK* is a commercially-developed financial misstatement predictor that is based entirely on publically-available financial statement information (Correia 2010; Price et al. 2011) and identifies the risk of misreporting primarily from overstated (understated) revenue and assets (expenses and liabilities) (Hobson et al. 2012). *AGR* incorporates both financial statement and governance information into a parsimonious misstatement predictor of the risk that a firm's financial statements "are misleading or fraudulent" (Price et al. 2011,

[25] To illustrate, suppose a whistleblowing allegation occurs in 2006 for the *WB* firm. I match the *WB* firm to the control firm with the closest propensity score based on the Bowen et al. (2010) determinants measured in 2005 for both the *WB* firm and the control firm. *WB* would be coded as 1 (0) in all years for *WB* (*non-WB*) firms. *POST* would be coded as 1 in 2007 for both the *WB* firm and its control firm and 0 for both firms in all other years. I require data to match in *t-1* for both the *WB* and control firms, and data for the models in years *t* and *t+1*.

759).[26] Jones et al. (2008) find that among academic measures of accounting quality, *AQ* has the best predictive ability to detect misreporting. Price et al. (2011) and Correia (2010) show that *ACCT RISK* and *AGR* perform at least as well as, and often better than, other misreporting predictor measures in the literature (including *AQ*). To test H1, I examine the relation between whistleblowing allegations and subsequent financial reporting aggressiveness using the following OLS model:

$$\Delta FIN\ REP_{it} = \beta_0 + \beta_1 WB_{it} + \beta_2 POST_{it} + \beta_3 WB_{it} * POST_{it} + \beta_J \Delta CONTROLS_{it} + \varepsilon_{it}, \quad (2)$$

Where *ΔFIN REP* is the year-over-year change in one of *AQ*, *ACCT RISK*, or *AGR* as described above; *WB* is an indicator of 1 if a firm is subject to employee whistleblowing at any time during the sample period and 0, otherwise (β_1 reflects time invariant differences in *ΔFIN REP* between *WB* and *non-WB* firms); *POST* is an indicator variable of 1 for *WB* (*non-WB*) firm observations in the year after the whistleblowing allegation (of the matched *WB* firm) and 0, otherwise (β_2 reflects the trend common to both treatment and control firms in terms of changes in firms' misreporting risk); *WB*POST* is the variable of interest (i.e., β_3 is the difference-in-differences estimator and reflects the effect of employee whistleblowing allegations on firms' subsequent changes in financial reporting aggressiveness relative to control firms not subject to such

[26] Audit Integrity does not use academic measures, market pricing data, or non-publicly available information to construct *ACCT RISK* or *AGR* (Price et al. 2011). Prior studies using *ACCT RISK* and/or *AGR* as empirical measures of financial misreporting risk (i.e., financial reporting aggressiveness) include Bentley et al. (2012), Charles et al. (2010), Correia (2010), Hobson et al. (2012), McGuire, Omer, and Wang (2012), Prawitt et al. (2011), and Price et al. (2011). The appendix provides additional information on the measures.

allegations); and *CONTROLS* is a vector of control variables described below and defined in the Appendix.[27] In all regressions, I calculate *t*-statistics using standard errors clustered by firm (Petersen 2009; Gow et al. 2010).[28] To the extent that whistleblowing has no significant effect on subsequent changes in financial misreporting risk, I expect β_3 to be statistically indistinguishable from zero.

I control for various factors that are likely to be associated with financial reporting aggressiveness and whistleblowing activity. Specifically, prior research suggests that press coverage is likely to be associated with larger whistleblowing events (Bowen et al. 2010) and documents that use of a Big N auditor (e.g., Behn et al. 2008), auditor changes (DeFond and Subramanyam 1998), auditor tenure (Myers et al. 2003), operational volatility (Dechow and Dichev 2002; Francis et al. 2004), firm size, profitability, capital structure, and growth opportunities (Dechow et al. 2010; Price et al. 2011), tangibility (Francis et al. 2004), capital needs (Dechow et al. 2011), and the incidence of losses (Price et al. 2011) are associated with measures of financial reporting aggressiveness. Accordingly, I control for whistleblowing press coverage (*PRESS*), as well as changes in use of a Big 4 auditor (*ΔBIG 4*), the firm's independent auditor (*ΔAUDITOR*), cash flow and sales volatility ($\Delta\sigma_{CFO}$ and $\Delta\sigma_{SALE}$), firm size (*ΔLN MVE*), profitability (*ΔROA*), leverage (*ΔLEVERAGE*), growth opportunities (*ΔBTM*), intangible

[27] Because the effect of whistleblowing on firms' subsequent reporting behavior is likely to be most salient directly following the whistleblowing activity, I examine the year following the allegation.

[28] The changes model in equation 2 removes industry and year effects. However, in supplemental analysis I find qualitatively similar results (coefficients have same sign and significance) for all tests when I include industry and year fixed effects.

intensity (*ΔINTANG*), , capital intensity (*ΔCAP INTENSITY*), raising capital (*ΔRAISE CAP*), and the incidence of losses (*ΔLOSS*) in the difference-in-differences model.[29]

4.4 Tax Avoidance

H2 suggests a negative association between employee whistleblowing allegations and subsequent tax avoidance. I adapt the Dyreng et al. (2008) long-run effective tax rate measure to construct two measures of tax avoidance for my tests: the three-year effective tax rate (*ETR*), which is the sum of current tax expense over the periods *t*, *t+1*, and *t+2*, scaled by pre-tax income before special items over the same time periods; and, the three-year cash effective tax rate (*CASH ETR*), which is the sum of cash taxes paid over the periods *t*, *t+1*, and *t+2*, scaled by the sum of pre-tax income before special items over the same time periods.[30] Using multi-year measures mitigates concerns of volatile tax rates incident to a single time period (Dyreng et al. 2008). *ETR* (*CASH ETR*) reflects tax avoidance that affects (does not affect) tax accrual accounts. These tax avoidance measures reflect the types of information available to and most likely scrutinized by external parties. To test H2, I estimate the following OLS model:

$$\Delta TAX\ AVOID_{it} = \beta_0 + \beta_1 WB_{it} + \beta_2 POST_{it} + \beta_3 WB_{it} * POST_{it} + \beta_J \Delta CONTROLS_{it} + \varepsilon_{it}, \quad (3)$$

[29] As discussed later, I also conduct time series tests in which I limit the analysis to firms subject to employee whistleblowing allegations. For purposes of these tests, I use levels rather than changes variables and include controls for auditor tenure (*TENURE*) and absence of intangibles (*NO INTANG*) consistent with prior research (Myers et al. 2003 and Francis et al. 2004, respectively). Note that for purposes of the difference-in-differences changes model, *TENURE* drops out of the model (given consistent year-over-year changes in auditor tenure) and I include changes in intangibles (*ΔINTANG*).

[30] Prior research uses past periods to construct tax avoidance measures (e.g., Dyreng et al. 2008). I use forward-looking measures because I am interested in how firms' tax avoidance changes subsequent to whistleblowing.

Where *ΔTAX AVOID* is the year-over-year change in one of *ETR* or *CASH ETR* as described above, *WB* and *POST* are defined as above, *WB*POST* is the variable of interest (i.e., β_3 is the difference-in-differences estimator and reflects the effect of employee whistleblowing allegations on firms' subsequent changes in tax avoidance relative to similar firms not subject to such allegations); and *CONTROLS* is a vector of control variables described below and defined in the Appendix. I control for whistleblowing press coverage (*PRESS*) and follow prior research to control for various factors associated with tax avoidance (Dyreng et al. 2010; McGuire et al. 2012; Mills et al. 1998; Rego 2003). These include changes in firm size (*ΔSIZE*), pre-tax profitability (*ΔROA*), leverage (*ΔLEVERAGE*), foreign operations (*ΔFOREIGN INC*), capital intensity (*ΔCAP INTENSITY*), use of a Big 4 auditor (*ΔBIG 4*), research and development (*ΔR&D*), and intangibility (*ΔINTANG*). Given the potential relation between firm-level growth and tax avoidance (Chen et al. 2010), I also control for changes in growth opportunities (*ΔBTM*) and sales growth (*SALES GROWTH*). Finally, I control for changes in cash holdings in the prior year (*CASH*) and net operating losses (*ΔNOL*).

5. RESULTS

5.1 Descriptive Statistics

I present all tables referenced in the manuscript in Appendix B. Table 1, Panel A reports the whistleblowing events by year and industry. The panel suggests that the whistleblowing events span various industries and occur fairly evenly across years. Recall that all of the whistleblowing cases in the study involve whistleblowing allegations related to financial misconduct covered under SOX.

Table 2, Panel A presents summary statistics of the model variables for the pooled sample. Tests for differences in means and/or medians reveal that the *WB* firm observations are more likely to use a Big 4 auditor (*BIG 4*), have longer auditor tenure (*TENURE*), have higher sales volatility (*STD SALE*), have greater market cap (*LN MVE*), hold more leverage (*LEVERAGE*), have lower book-to-market ratios (*BTM*) and are more likely to report no intangibles (*NO INTANG*). They are also larger (*SIZE*), hold less cash (*CASH*), and pay higher audit fees (*LN AUDIT FEES*). Table 2, Panels B and C present the Pearson correlation coefficients for the financial reporting and tax avoidance respectively. The coefficients suggest that *WB*POST* is negatively (positively) associated with measures of financial reporting aggressiveness (three-year effective tax rates) although the coefficients are not significant in all cases. I use difference-in-differences and time series estimation in a multivariate setting to test my hypotheses.

5.2 Matching

Table 3 presents the covariate balance (i.e., results of tests for differences in means, medians, and distributions for matching variables in equation 1) between treatment (*WB*) and control (*non-WB*) firms, which are matched in the year prior to the whistleblowing event. Covariate balance is important in the whistleblowing context because it mitigates concerns that observed effects could be driven by differences between treatment and control firms that lead to whistleblowing allegations. I do not find significant differences in means (*t*-tests), medians (Wilcoxon rank-sum tests), or distributions (Kolmogorov-Smirnov homogenous distributions tests) between the treatment and control firms for any of the matching variables, suggesting that the propensity score matching process maintains covariate balance along relevant variable dimensions (Tucker 2010).

5.3 Financial Reporting Risk Results

Table 4 reports the results of tests of H1, which suggests that in the year following employee whistleblowing allegations, firms are associated with decreases in financial reporting aggressiveness relative to firms not subject to such allegations. Table 4, columns 1-3 report the results of the changes difference-in-differences model specification (i.e., year-over-year changes in the dependent and independent variables) for the full sample period. Columns 4-6 of Table 4 report the results of time series tests, which limit the analysis to *WB* firms to ensure that the results are not an artifact of the matching process. Because the time series tests only include *WB* firms, *WB* and *WB*POST* are omitted from the model and the variable of interest for these tests is

POST. The results indicate that for the analysis using *ACCT RISK*, the coefficient on *WB*POST* is negative and significant (*p*-value < 0.05) across the difference-in-differences and time series model specifications. The results also suggest that for the analysis using *AGR*, the coefficient on *WB*POST* is negative and significant in both the difference-in-differences and time series model specifications (*p*-value < 0.05). For each of the estimated models, the *Std Coef.* columns report standardized coefficients, which reflect the standard deviation change in the dependent variable associated a change from 0 to 1 (for binary variables) and the standard deviation change in the dependent variable for a standard deviation change in the independent variable (for continuous variables). The standardized coefficients suggest that the effect of employee whistleblowing on subsequent misreporting risk is economically significant. For example, firms subject to employee whistleblowing to OSHA are associated with .88 (.48) standard deviation decrease in *ACCT RISK* (*AGR*) in the year following the allegations relative to firms not subject to such allegations. In combination, these results suggest that firms subject to whistleblowing allegations are associated with significantly decreases in financial misreporting risk in the year following whistleblowing allegations.

The coefficient on *WB*POST* is insignificant for *AQ* in the analyses (*p*-value > 0.10). The coefficients on the changes in the control variables suggest that after matching on a variety of dimensions, changes in sales and operating volatility (*ΔSTD CFO* and *ΔSTD SALE*), market cap (*ΔLN MVE*), leverage (*ΔLEVERAGE*), intangibility (*ΔINTANG*), raising capital (*ΔRAISE CAP*), and losses (*ΔLOSS*) are significant in different model specifications. The results in Table 4 are consistent with H1 and with

economic theory, which suggests that increases in the perception of the likelihood of detection (related to whistleblowing) increase the expected costs of subsequent financial misconduct such that firms are associated with decreased financial reporting aggressiveness in the year following whistleblowing.

5.4 Tax Avoidance Results

Table 5 reports the results of tests of H2, which suggests that in the period following employee whistleblowing allegations, firms are associated with decreases in tax avoidance relative to firms not subject to such allegations. As in Table 4, I present the results of difference-in-differences changes model specifications (columns 1-2) as well as time series tests for *WB* firms (columns 3-4). I find that the coefficient on *WB*POST* is positive and significant (p-value < 0.05) in each of the difference-in-differences changes and time series model specifications using *CASH ETR*. I also find that for the *ETR* specifications, the coefficient on *WB*POST* is positive and significant (p-value < 0.05) in the difference-in-differences model and marginally significant (p-value < 0.10) in the time series model. The standardized coefficients suggest that the effect of employee whistleblowing on changes in subsequent tax avoidance are also economically significant. For example, firms subject to employee whistleblowing to OSHA are associated with .398 (.422) standard deviation increase in *ETR* (*CASH ETR*) in the year following the allegations relative to firms not subject to such allegations. Collectively, these results suggest that firms subject to whistleblowing are associated with significantly greater increases in effective tax rates (i.e., decreases in tax avoidance behavior) in the period following such allegations. The coefficients on the control

variables vary by model specification (e.g., the coefficients on *ΔROA, ΔLEVERAGE*, *ΔFOREIGN INCOME ΔBTM, ΔCASH*, are significant— p-value < 0.05—in different specifications), but are largely insignificant, which is consistent with the treatment and control firms being matched on a variety of dimensions associated with tax avoidance determinants (e.g., size, firm performance, growth, etc. in equation 1). The results in Table 5 are consistent with H2 and with economic theory, which suggests that increases in the perception of the likelihood of detection (due to whistleblowing) should increase the expected costs of subsequent tax avoidance such that it deters tax avoidance in the period following the whistleblowing.

6. ADDITIONAL ANALYSES

I conduct various robustness checks and additional tests to further examine firms' tax and financial reporting responses to employee whistleblowing. Except as noted below, the results are qualitatively similar (where qualitatively similar means the coefficient on *WB*POST* is the same sign and *p*-value < 0.05) in each of the analyses discussed below.

6.1 External Monitoring

As noted previously, prior studies document evidence that external monitors (e.g., analysts, short sellers, institutional investors, auditors, and regulators) mitigate some aggressive tax and financial reporting behavior.[31] Thus, it is important to assess how actual external monitoring (versus perceptions of potential increases in future external monitoring because of whistleblowing) affects the main results. In untabulated tests, I repeat the analyses after controlling for (changes in) institutional ownership, analyst coverage, short interest, the probability of IRS audit (using the Transaction Research Access Clearinghouse data), and the auditor control variables used in the main tests (changes in use of a Big N and changes in a firm's independent auditor). Because firms could be more sensitive to external party scrutiny following periods in which they have experienced financial reporting irregularities, I also repeat the analyses after controlling for both the external monitors noted above as well as for prior period

[31] See, for example, Becker et al. (1998), Chung et al. (2002), Desai et al. (2006), Francis et al. (1999), Hoopes et al. (2012), Jennings et al. (2011), Kedia and Rajgopal (2011), Khurana and Moser (2012), Kinney et al. (2004), Xie et al. (2003) and Yu (2008).

financial restatements, shareholder lawsuits related to accounting improprieties, and SEC enforcement actions. The results (untabulated) are qualitatively similar to those reported for the main tests.

6.2 Accrual Reversals

Dechow et al. (1996) find that in the year following periods in which firms are subject to SEC enforcement (AAERs), firms have lower (discretionary) accruals. They attribute this finding to accrual reversals from the misreporting period. Their evidence suggests the possibility that the financial reporting findings reflect *WB* firms having abnormally large accruals during the whistleblowing period that reverse in the following period. To investigate this possibility, I examine differences in absolute abnormal accruals and capital market pressure (*CM_PRESSURE*) between treatment and control firms in *t-1* and *t* (where *t* is the whistleblowing period) and find no significant differences between treatment and control firms in *t-1* or *t*, which mitigates concerns that the main results are induced by relatively larger abnormally high accruals in the whistleblowing firms simply reversing in the period following the whistleblowing allegations (*POST*).

6.3 Other Robustness Checks

To assess the sensitivity of the results to other design selections, I conduct three additional analyses (results untabulated). First, Bowen et al. (2010) note differences in the nature of and economic consequences to whistleblowing cases revealed in the press versus those reported to OSHA. To confirm that the main results are not driven by the *WB* firms whose allegations are also revealed in the press, I repeat my analyses after

removing *WB* firms (and their respective control firms) that are subject to whistleblowing press coverage at any point in the sample period and find qualitatively similar results.[32] Second, I assess the effect of option grants on firms' tax and financial reporting responses to whistleblowing allegations. Call et al. (2012) find that stock option grants are negatively associated with employee whistleblowing activity. Noting that stock options also potentially affect both financial reporting income (post SFAS 123R) as well as tax liabilities, I repeat my analyses after controlling for stock option grants and find qualitatively similar results.[33] In a final robustness check, I examine the sensitivity of the results to the one-to-one matching design used in the main tests. In particular, I repeat the analyses after matching each *WB* firm to the five control firms with the nearest propensities to be subject to whistleblowing and generally find qualitatively similar results.

6.4 Placebo Falsification Test

Difference-in-differences estimation techniques rely on a "parallel trends" assumption, which suggests that the average response would have been the same for both treatment and control firms absent the treatment (Roberts and Whited 2012). Although this assumption is not formally testable, I conduct a placebo or falsification test to mitigate concerns that the parallel trends assumption could be violated. To conduct the test, I falsely assume that the onset of treatment (whistleblowing) occurs in

[32] The coefficient on *WB*POST* is marginally significant (*p*-value < 0.10) for Δ*ETR* and the *p*-value is .105 for Δ*AGR*. All other results are consistent with those reported for the main tests.
[33] The coefficient on *WB*POST* is marginally significant (*p*-value < 0.10) for Δ*AGR*. All other results are consistent with those reported for the main tests.

the year prior to the match year (i.e., two years before the whistleblowing event year) and repeat estimation. I find, as expected, that falsely assuming that the whistleblowing event occurs in *t-2* (the year prior to the match year) yields insignificant results (*p*-values > 0.10) for all analyses.

6.5 Investments in Tax Services

It is likely that employee whistleblowing allegations also affect firms' future investments in tax services to the extent that they increase the threat of future IRS scrutiny. On one hand, actual employee whistleblowing reports are likely to increase the expected probability of IRS audit, especially given the potential for a whistleblower to explicitly identify and reveal "soft spots" in firms' tax positions. Thus, firms subject to whistleblowing potentially invest less in future tax services whose value depends upon the outcomes of such scrutiny (e.g., potential tax reversals, penalties, and interest assessments). On the other hand, employee whistleblowing potentially encourages management to invest in more future tax services to bolster or defend the firm's previous (uncertain) tax positions. Because firms potentially respond to employee whistleblowing with either higher or lower investments in tax services, I expect that in the year following employee whistleblowing allegations, firms invest in significantly different levels of tax services relative to firms not subject to such allegations.

To examine this possibility, I follow prior research to use tax services fees paid to one's auditor as a proxy for investments in tax services (Lassila et al. 2010; McGuire

et al. 2012; Omer et al. 2012).[34] Because the decision to engage one's auditor for tax services is not random, I follow this prior research to employ a Heckman (1979) two-step procedure to model the decision to engage one's auditor for tax services. I first estimate the following probit regression (selection model):

$$PR(AUDTAX)_{it} = \alpha_0 + \beta_1 WB_{it} + \beta_2 POST_{it} + \beta_3 WB_{it} * POST_{it} + \beta_4 PRESS_{it} + \beta_5 INST\ OWN_{it} + \beta_6 AUD\ IND_{it} + \beta_7 TENURE_{it} + \beta_8 \Delta AUDITOR_{it} + \beta_9 LN\ AUDIT\ FEES_{it} + \beta_{10} BIG\ 4_{it} + \beta_{11} MERGER_{it} + \beta_{12} AQ_{it} + \beta_J CONTROLS_{it} + \beta_K INDUSTRY + \beta_L YEAR + \varepsilon_{it} \quad (4)$$

Where *AUDTAX* is an indicator variable of 1 if a firm engages its auditor for tax services and 0, otherwise; *CONTROLS* is the vector of control variables used in equation 3; and all other variables are defined in the Appendix.[35] I then use the parameter estimates from this selection model to construct the inverse Mills Ratio (*INVS MILLS*), which I include in the following OLS regression (outcome model):

$$TAX\ FEES_{it} = \alpha_0 + \beta_1 WB_{it} + \beta_2 POST_{it} + \beta_3 WB_{it} * POST_{it} + \beta_4 PRESS_{it} + \beta_5 INST\ OWN_{it} + \beta_6 BIG\ 4_{it} + \beta_7 MERGER_{it} + \beta_8 AQ_{it} + \beta_{9\text{-}21} CONTROLS_{it} + \beta_{22} INVMILLS_{it} + \beta_J INDUSTRY + \beta_K YEAR + \varepsilon_{it}, \quad (5)$$

Where *TAX FEES* is fees paid to one's auditor for tax services, scaled by total sales, *WB*, *POST*, and *INV MILLS* (all other variables) are defined above (also see the Appendix),

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[34] Consistent with this prior research, I use tax service fees paid to one's auditor as a proxy for investments in tax services because other tax fees paid are typically not observed outside the firm. Since 2003, the SEC has required firms to disclose tax service fees paid to their auditor (Omer et al. 2006).

[35] For the investment in tax services models, I standardize the variables (scale each by its standard deviation) for presentation (i.e., unstandardized variables have multiple leading zeroes right of the decimal). The results are qualitatively similar (coefficient on *WB*POST* is negative and significant, $p < 0.05$) using unstandardized variables.

CONTROLS is a vector of control variables as used in equation 3, and *WB*POST* is the variable of interest.[36]

Table 6 displays the results of the selection model (probit model in equation 4) of a firm's decision to engage its auditor for tax services.[37] Consistent with Lassila et al. (2010) and McGuire et al. (2012), I find that the model has relatively good fit, which suggests that equation 4 adequately models the average sample firm's decision to engage its independent auditor for tax services. As discussed previously, this is important given the non-randomness of firms selecting their auditor to provide tax services. Model fit tests indicate the area under the ROC curve is 0.833, suggesting that the model has good discriminatory power (Hosmer and Lemeshow 2000), and the Pseudo R-squared is 0.271. I also conduct a Hosmer and Lemeshow goodness of fit test and find that I cannot reject the null hypothesis of good model fit (*p*-value = 0.162).

Tables 7 reports the results of the outcome model (OLS model in equation 5) for the investments in tax services test. I find that the coefficient on *WB*POST* is negative and significant (*p*-value < 0.05), suggesting that firms subject to whistleblowing allegations are associated with significantly lower tax service fees in the period following such allegations relative to control firms not subject to whistleblowing. This is consistent with employee whistleblowing potentially increasing the expected costs of tax

[36] To estimate the outcome model, prior research only retains observations that engage their auditor for tax services (McGuire et al. 2012). Accordingly, I require that *WB* firms and their control firms engage their auditor for tax services in both *t* and *t+1*, where *t* is the year of the *WB* event, in order to be included in Equation 5.

[37] For purposes of this analysis, I use Fama and French 12 industry classifications for industry fixed effects due to lack of variation in the dependent variable (*AUDTAX*) within finer classifications (e.g., two-digit SIC code).

avoidance activities in light of perceptions of increased scrutiny of the firm's tax positions. I also find that the coefficients on *ROA* and *FOREIGN INC* (*SALES GROWTH*) are positive (negative) and significant (*p*-value < 0.05).[38]

6.6 Geographic Location of OSHA Office

The OSHA whistleblowing cases are reported to one of 10 OSHA offices. To the extent that geographic location is correlated with both whistleblowing allegations and changes in firms' tax and financial reporting behavior following employee whistleblowing, it is important to control for geographic location in the analyses. Due to the limited number of whistleblowing cases, it is important to not impose undue matching criteria that can eliminate treatment (whistleblowing firms) based on common support (Tucker 2010) restrictions, which remove treatment firms that manifest a higher (lower) propensity to be subject to whistleblowing allegations than any of the potential match firms in the sample. Thus, for the primary tests, in order to maximize the potential number of nearest match firms, I do not require the treatment and control firms to be in the same OSHA region. I believe this to be the most appropriate approach because (1) although the offices are distinct, the OSHA regional offices are under a single national authority; (2) a whistleblower is able to report allegations to the national office or any OSHA office and (3) the OSHA regional offices each report the information related to the whistleblower's complain to the pertinent regulator (e.g., directly to the SEC, which

[38] Consistent with Lennox et al. (2012), as an additional analysis (untabulated), I exclude the estimate of the selection bias parameter (*INV MILLS*) to ensure that the results are not an artifact of the Heckman (1979) procedure. I find qualitatively similar results (the coefficient on *WB*POST* is the same sign and *p*-value < 0.05). In untabulated tests, I examine changes in tax service fees paid and find that the coefficient on *WB*POST* is negative, but weaker (*p*-value = 0.241), which is likely a result of a less powerful test given the smaller sample (i.e., about 20 percent smaller) used in the changes test.

is a primary mechanisms through which one would expect a potential change in the firms' tax and financial reporting behavior following the employee whistleblowing). However, to examine the effect of how controlling for particular geographic locations affects the results, I include state fixed effects in the time series analyses (i.e., which are limited to the whistleblower firms). After controlling for geographic location of whistleblowing, the results are qualitatively similar to those reported in the primary analyses.

6.7 Persistence of Whistleblowing Effect

For the primary analyses, I argue the effect of whistleblowing on firms' subsequent reporting behavior is likely to be most salient directly following the whistleblowing activity. I expect that the deterrent effect of whistleblowing allegations is directly related to the proximity of the allegation itself; that is, I expect that the deterrent effect of a whistleblowing allegation weakens with time (i.e., since the allegation was reported). To examine this possibility further, I examine the effect of whistleblowing allegations on firms' financial reporting behavior two and three years following the whistleblowing event.[39] I find no consistent evidence that firms subject to employee whistleblowing allegations have significantly different misreporting risk relative to control firms not subject to such allegations, which suggests that deterrent effects of whistleblowing are significantly related to the recentness of the allegations.

[39] The use of three-year forward looking effective tax rates does not provide sufficient data in the t+2 and t+3 periods to conduct meaningful tax avoidance tests.

6.8 Manager Turnover and Changes in Tax and Financial Reporting Behavior

Prior research suggests that individual managers significantly influence firm-level behaviors (Bamber et al. 2010; Bertrand and Schoar 2003; Dyreng et al. 2010; Ge et al. 2011). Thus, to the extent that employee whistleblowing is associated both with management turnover (which seems plausible), observed results could potentially be a function of changes in management, who in turn alter financial and tax reporting behavior. To investigate the effect of CEO turnover on the results, I construct a CEO turnover indicator variable using data from Execucomp. Consistent with the other tests, my focus for this variable is on whether there is CEO turnover in the event year (whistleblowing year for treatment firms and pseudo event year for control firms) or the year following the (pseudo) event year. After controlling for CEO turnover in these years, I find that the results are qualitatively similar to the results reported in the paper (i.e., same sign and significant at p-value < 0.05), suggesting that the primary results are robust to managerial turnover as an alternative explanation for the changes in tax and financial reporting behavior following employee whistleblowing.

6.9 Single Changes Difference-in-differences Model

The primary analyses in the study use change specifications to examine whether changes in tax and financial reporting behavior are significantly different in the year following whistleblowing. An alternative approach is to limit the analysis to changes from time t to t+1, where t is the (pseudo) whistleblowing year. To assess the robustness of the results to this alternative approach, I repeat the analyses using only the observations for changes from t to t+1 and find that the results are qualitatively similar to

those reported for the primary tests (Table 8 presents the results of the financial reporting analysis).[40] The tax avoidance model does not appropriately reflect the response (i.e., the adjusted R-squared for *ΔCASH ETR* is negative, suggesting concerns with the model). Thus, I tabulate only the financial reporting results for this analysis.

[40] The coefficients for *ΔAGR* and *ΔETR* are slightly weaker (*p*-values = 0.082 and 0.172, respectively) for this test.

7. CONCLUSION

Recent Congressional actions have increased the regulatory emphasis on employee whistleblowing programs at both the SEC (SEC 2012) and the IRS (IRS 2012). Although considerable literature examines the role of external parties in revealing financial misconduct, high profile accounting scandals have raised concerns about external parties' ability to effectively detect financial misconduct (Hobson 2012; PCAOB 2007; Zingales 2004). Although whistleblowing likely enables employees to be effective monitors, we have limited evidence on how whistleblowing influences firms' subsequent tax and financial reporting behavior. I draw on economic theory (e.g., Allingham and Sandmo 1972; Becker 1968) to develop expectations for and test firms' tax and financial reporting responses to employee whistleblowing allegations.

Using a unique dataset of employee whistleblowing allegations obtained from the U.S. government via Freedom of Information Act requests, I find that firms subject to whistleblowing engage in significantly less aggressive financial reporting in the year following whistleblowing allegations relative to matched control firms. I also find that firms subject to employee whistleblowing have significant increases in their three-year current and cash effective tax rates in the year following the whistleblowing. Supplemental tests examining the effects of external monitoring; restatements, shareholder lawsuits, and SEC enforcement actions; option grants; whistleblowing press coverage; and falsification tests corroborate the main results.

This study contributes to the literature by providing evidence on firms' tax and financial reporting responses to employee whistleblowing allegations. The whistleblowing literature provides evidence of employees' ability to uncover financial misconduct, the characteristics of firms subject to whistleblowing, and the governance and economic consequences to such allegations (Bowen et al. 2010; Call et al. 2012; Dyck et al. 2010). This study extends the literature by examining firms' tax and financial reporting decisions subsequent to such allegations. In addition, while prior research examines the role of external monitors on tax and financial reporting (e.g., Becker et al. 1998; Chung et al. 2002; Hoopes et al. 2012; Kedia and Rajgopal 2011), the results of this study highlight the indirect but important role that employees play in tax and financial reporting oversight via whistleblowing allegations. This study contributes to the literature that examines the role of localized monitoring on financial reporting discretion (e.g., Ayers et al. 2011; Dyck et al. 2010; Kedia and Rajgopal 2011) by highlighting how whistleblowers' access to inside information and ability to communicate information to external parties appears to significantly increases the expected costs of firms' subsequent misconduct. Finally, this study contributes to the literature that examines the relation between the tax and financial reporting behavior (Erickson et al. 2004; Frank et al. 2009; Lennox et al. 2013; Lisowsky 2010; Wilson 2009) by highlighting how whistleblowing is associated with subsequent changes in both tax and financial reporting behavior, consistent with perceptions of increased scrutiny of financial activities generally.

The inferences of this study are subject to some important limitations. The OSHA whistleblowing cases provide a unique setting in which to examine the effect of whistleblowing allegations on firms' subsequent tax and financial reporting behavior. However, because they relate to discrimination complaints associated with previously internal allegations of financial misconduct, it is possible that they reflect only the most egregious offenders, which are most likely to change their behavior. Further, the distinct nature of the OSHA cases is such that it is possible that such effects do not generalize to all whistleblowing settings. With these caveats in mind, I look forward to future research that examines other consequences of whistleblowing activity such as the effect of broadly-publicized whistleblower awards and the growing regulatory emphasis on whistleblower programs.

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APPENDIX

Variable Descriptions

Dependent Variables (Accounting Risk, Tax Avoidance, and Investments in Tax Services Measures)

ACCT RISK	=Accounting Risk. *ACCT RISK* is an *ex ante* predictor measure of the risk that a firm's financial statements are misreported in a given period and is based on financial statement information (including footnotes). It ranges from 0 to 100, higher values reflecting greater accounting risk. Commercial vendor Audit Integrity, LLC, provides the measure. The inputs of measure do not include market pricing data or any academic measure and come from exclusively from publically available information. Audit Integrity examines expense and revenue recognition, high-risk events and asset and liability valuation in the context of changes from prior years, deviations from industry norms and volatility to construct the measure.
AGR	=Fraud Risk. *AGR* is an *ex ante* predictor measure of the risk that a firm's financial statements "are misleading or fraudulent" in a given period and is based on financial statement and governance information (Price et al. 2011, 759). It ranges from 0 to 100, higher values reflecting greater misstatement risk. Commercial vendor Audit Integrity, LLC, provides the measure. The inputs of measure do not include market pricing data or any academic measure and come from publically available information and Audit Integrity examines expense and revenue recognition, high-risk events, governance, and asset and liability valuation in the context of changes from prior years, deviations from industry norms and volatility to construct the measure.
ETR	= a three-year forward measure (i.e., measured at t+1, t+2, and t+3) reflecting aggregate worldwide current tax expense (total tax expense (txt) less deferred tax expense (txdi)) for the period, scaled by aggregate pre-tax income (pi) before special items (spi) for the period. *ETR* is winsorized at [0,1] and observations with negative denominators are excluded from the analyses.
CASH ETR	= a three-year forward measure (i.e., measured at t+1, t+2, and t+3) reflecting aggregate cash taxes paid (txpd) for the period, scaled by aggregate pre-tax income (pi) before special items (spi) for the period. *CASH ETR* is winsorized at [0,1] and observations with negative denominators are excluded from the analyses.
AUDTAX	= 1 if a firm engages its independent auditor for tax services in a given year and 0, otherwise.
TAX FEES	= total tax service fees paid to an auditor (from Audit Analytics), scaled by total sales.

Whistle-blowing Activity Variables

WB	= 1 if firm is subject to whistleblowing allegations as reported to OSHA at any point from 2003-2010 and 0, otherwise.
POST	= 1 for the period following the whistleblowing allegation (for whistleblowing firms); 1 for the period following the whistleblowing allegation of the matched whistleblower firm (for matched control firms); and 0, otherwise.
*WB*POST*	= an interaction term between *WB* and *POST*.
PRESS	= 1 if a whistle-blowing activity for the firm is covered in the press during the sample period, and 0 otherwise.

Control Variables

SIZE	= the natural log of total assets (at).
ROA	= pre-tax income (pi), scaled by assets at the beginning of the year (at).
LEVERAGE	= long-term debt (dltt) plus current portion of long-term debt (dlc), scaled by total assets (at).
FOREIGN INC	= 1 if a firm reports non-missing and non-zero pre-tax foreign income for the year, and 0 otherwise.
CAP INTENSITY	= net PP&E (ppent), scaled by total assets (at).
RD	= research and development expense (xrd, set to 0 if missing), scaled by sales (sale).
INTANG	= intangible assets (intan, set to 0 if missing), scaled by total assets (at).
BTM	= book equity (ceq) divided by market value of equity (prcc_f * csho).
SALES GROWTH	= year over year percentage change in sales (sale).
NOL	= 1 if a firm has a net operating loss (tlcf) in a given year, and 0 otherwise.
ΔNOL	= the change in net operating loss (tlcf) from the prior year, scaled by total assets at the beginning of the year (at).
CASH	= cash/cash equivalents in the prior year (che), scaled by assets in the prior year (at).
INST OWN	= percentage of shares held by institutions at the beginning of the year (data obtained from Thomson Reuters). I set missing values to 0.

Variable Descriptions: Continued

TENURE	= natural log of the number of years for which firm has engaged its independent auditor.
ΔAUDITOR	= an indicator variable of 1 if a firm changes its auditor in a particular year and 0 otherwise. Initial years in Compustat are not treated as an auditor change.
LN AUDIT FEES	= natural log of total audit fees (from Audit Analytics).
BIG 4	= 1 if a firm engages a Big 4 auditor for its independent audit and 0, otherwise.
AUD IND	= (non-audit fees less tax fees), divided by total audit fees (Lassila et al. 2010).
MERGER	= 1 if a firm engages in a merger in given year (per Compustat footnotes); 0, otherwise.
AQ	= accruals quality (Dechow and Dichev 2002 as modified by McNichols 2002), calculated cross-sectionally by industry (Jones et al. 2008) and requiring at least 10 observations per industry in each year.
σ_{CFO}	=standard deviation of [cash flow from operations (oancf), scaled by assets (at)] over the prior three years.
σ_{SALE}	=standard deviation of [sales (sale), scaled by assets (at)] over the prior three years.
LN MVE	= natural log of the market value of equity (prcc_f * csho).
NO INTANG	= 1 if a firm has no research and development (xrd, set to 0 if missing) or advertising expense (xad, set to 0 if missing) for the period and 0, otherwise.
RAISE CAP	= 1 if a firm issues stock or long term debt in the given year and 0, otherwise.
LOSS	= 1 if a firm's income before extraordinary items (ib) is negative in any of the current or prior two years and 0, otherwise.
Matching Variables	
CM_PRESSURE	= following Bowen et al. (2010), the average scaled rank of need to access capital (Dechow et al. 1996), merger and acquisition activity, and potential earnings management measured as absolute discretionary accruals using a performance and operating cash-flow-adjusted modified Jones (1991) model.
GROWTH	= following Bowen et al. (2010), the scaled rank of sales growth over the prior three years.
PAST_PERF	= following Bowen et al. (2010), the scaled rank of stock returns over the prior year.
REPUTATION	= following Bowen et al. (2010), an indicator of 1 if the firm is listed as either a "Most Admired" firm or a "Best Place to Work For" by *Fortune* magazine in any of the five prior years and 0, otherwise.
COMMUNICATION	= following Bowen et al. (2010), the average scaled rank of age (reverse signed) and prior year Herfindahl-Hirschman indices for industry concentration and geographic concentration (Bushman et al. 2004).
DOWNSIZE	= following Bowen et al. (2010), the scaled rank of average employee growth over the prior three years.
QUITAM	= following Bowen et al. (2010), an indicator of 1 if the firm is in the healthcare industry (2-digit SIC code = 80) or appeared on the "100 Companies Receiving the Largest Dollar Volume of Prime Contract Awards" list in any of the prior three years, and 0 otherwise.
SIZE	= following Bowen et al. (2010), the scaled rank of total sales revenue in the prior year.
ICW	= following Bowen et al. (2010), the scaled rank of fitted values of internal control weaknesses (Doyle et al. 2007).

Figure 1: Sequence of Employee Whistleblowing Activities and Firm-level Responses

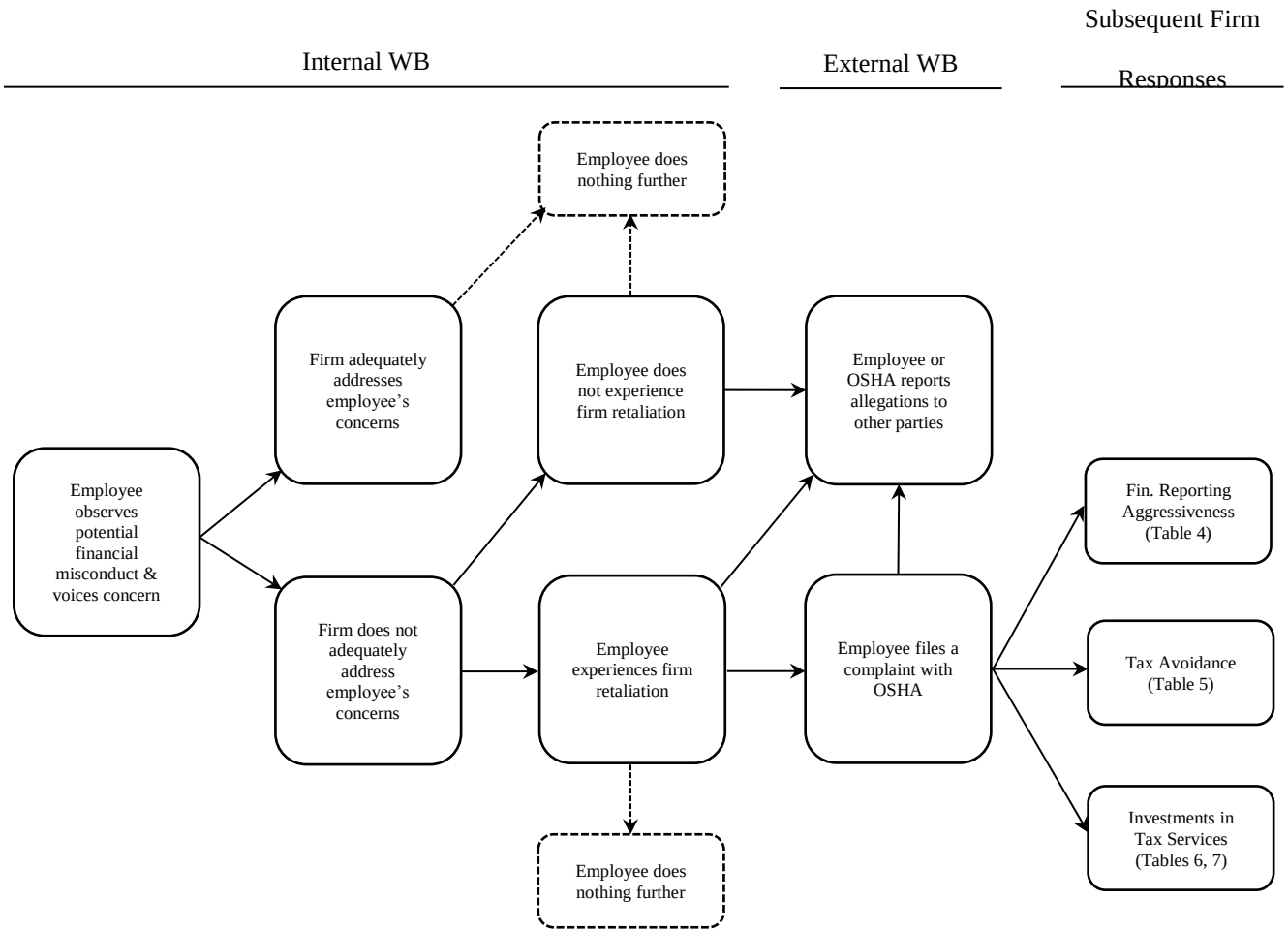

Figure 1: Continued

Figure 1: Illustrates the sequence of employee whistleblowing (WB) events progressing from internal WB activities to external WB allegations to firms' subsequent tax and financial reporting responses to such allegations.

Table 1

Sample of Whistleblowing Allegations

Panel A: Whistleblowing allegations by year and industry

Industry	Description	2004	2005	2006	2007	Total
1000-1999	Mining, Building	1	0	1	1	3
2000-2999	Construction	1	2	5	3	11
3000-3999	Manufacturing	2	8	3	2	15
4000-4899	Transportation & Communication	1	1	0	0	2
5000-5999	Wholesale, Retail	2	3	2	3	10
7000-7999	Hotels, Services	1	1	4	2	8
8000-8999	Services	1	2	1	0	4
9000-9999	International, Non-operating	0	1	0	0	1
		9	18	16	11	54

Note: Although all whistleblowing allegations used in this study relate to financial misconduct covered under SOX, several OSHA regions did not provide sufficient information to identify the specific type of allegation involved (e.g., financial versus tax fraud, financial reporting irregularity, tax misreporting, earnings management, etc.).

Table 2

Panel A: Descriptive Statistics

	WB-Firms (Firm-year obs = 271)			Control (non-WB) Firms (Firm-year obs= 271)			
Variable	**Mean**	**Median**	**Std**	**Mean**	**Median**	**Std**	**Models**
AQ	(0.02)	(0.01)	0.05	(0.01)	(0.01)	0.06	a, c
ACCT RISK	51.92	55.00	25.10	50.96	51.00	24.68	a
AGR	58.46	62.00	24.75	50.23	50.50	24.82	a
ETR	0.31	0.28	0.17	0.29	0.29	0.16	b
CASH ETR	0.29	0.26	0.19	0.28	0.26	0.17	b
TAX FEES	**0.53**	0.28	0.75	**0.74**	0.17	1.11	d
POST	0.20	0.00	0.40	0.19	0.00	0.39	a,b,c,d
PRESS	**0.11**	**0.00**	0.31	**0.00**	**0.00**	0.00	a,b,c,d
BIG 4	**1.00**	**1.00**	0.00	**0.98**	**1.00**	0.13	a,b,c,d
ΔAUDITOR	0.01	0.00	0.10	0.03	0.00	0.18	a,c,d
TENURE	**2.51**	**2.83**	0.88	**2.24**	**2.30**	0.99	a,c,d
STD CFO	0.03	0.02	0.03	0.03	0.03	0.03	a
STD SALE	**0.10**	0.07	0.11	**0.12**	0.08	0.13	a
LN MVE	**8.78**	**8.80**	1.79	**8.24**	**8.18**	1.33	a
ROA	0.11	0.11	0.10	0.11	0.10	0.09	a,b,c,d
LEVERAGE	**0.25**	**0.22**	0.17	**0.19**	**0.19**	0.13	a,b,c,d
BTM	**0.40**	**0.33**	0.28	**0.45**	**0.37**	0.28	a,b,c,d
INTANG	0.23	0.19	0.18	0.20	0.19	0.18	a,b,c,d
NO INTANG	**0.30**	**0.00**	0.46	**0.20**	**0.00**	0.40	a
CAP INTENSITY	0.21	0.17	0.15	0.24	0.18	0.17	a,b,c,d
RAISE CAP	**0.98**	**1.00**	0.15	**0.94**	**1.00**	0.24	a
LOSS	0.20	0.00	0.40	0.19	0.00	0.39	a
SIZE	**8.69**	**8.75**	1.55	**8.16**	**8.13**	1.18	b,c,d
FOREIGN INC	0.62	1.00	0.49	0.65	1.00	0.48	b,c,d
CASH	**0.12**	**0.06**	0.14	**0.15**	**0.09**	0.16	b,c,d
NOL	0.68	1.00	0.47	0.67	1.00	0.47	b,c,d
ΔNOL	0.00	0.00	0.04	0.00	0.00	0.03	b,c,d
RD	0.04	0.00	0.06	0.03	0.00	0.05	b,c,d
SALES GROWTH	0.11	0.10	0.15	0.10	0.09	0.14	b,c,d
INST OWN	0.69	0.75	0.28	0.71	0.77	0.27	c
LN AUDIT FEES	**1.35**	**1.32**	1.05	**0.96**	**1.03**	0.94	c,d
AUD IND	0.15	0.08	0.21	0.14	0.09	0.17	c,d
MERGER	0.31	0.00	0.46	0.29	0.00	0.46	c,d

Table 2: Continued

a. Financial reporting aggressiveness model (equation 2).

b. Tax avoidance model (equation 3).

c. (d.) Investments in tax services selection model, equation 4 (outcome model, equation 5).

Summary statistics of variables (defined in the Appendix). I require variables for *WB* and match (*non-WB*) firms in *t* and *t+1* (*t* = whistleblowing year). Potential differences in *WB* and *non-WB* observations arise from *WB* (*non-WB*) firm having more or fewer observations in periods before *t* or after *t+1*. For tests using *ACCT RISK* and *AGR*, the number of observations is 204 (201) for *WB* (*non-WB*) firms. Difference in variables across *WB* and *non-WB* firm are in bold.

Table 2: Continued

Panel B: Pearson Correlation Coefficients (Financial Reporting Tests)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	AQ																				
1	*ACCT RISK*	-0.05																			
2	*AGR*	-0.04	**0.81**																		
3	*WB*	-0.07	0.03	0.07																	
4	*POST*	-0.02	-0.01	-0.03	0.01																
5	*WB * POST*	-0.03	-0.06	-0.06	**0.33**	**0.68**															
6	*PRESS*	-0.06	0.00	0.00	**0.24**	0.01	**0.09**														
7	*BIG 4*	**-0.09**	0.03	0.06	**0.10**	-0.05	0.03	0.02													
8	*ΔAUDITOR*	-0.02	-0.06	-0.03	-0.08	-0.04	-0.05	-0.04	0.01												
9	*TENURE*	-0.02	0.06	0.03	**0.14**	0.05	**0.09**	-0.07	**0.14**	**-0.38**											
10	*STD CFO*	**0.09**	-0.03	**-0.09**	-0.02	0.01	0.00	0.02	**-0.14**	0.01	-0.04										
11	*STD SALE*	-0.06	-0.01	-0.05	**-0.10**	-0.05	**-0.09**	-0.01	0.00	0.04	-0.04	**0.42**									
12	*LN MVE*	**-0.20**	**0.23**	**0.30**	**0.17**	0.00	0.05	**0.20**	**0.20**	**-0.09**	**0.22**	**-0.34**	**-0.25**								
13	*ROA*	-0.08	**0.10**	**0.11**	0.02	0.01	0.04	**0.10**	**0.12**	**-0.11**	**0.14**	0.08	0.08	**0.38**							
14	*LEVERAGE*	**0.13**	0.04	**0.14**	**0.20**	-0.01	0.05	**-0.11**	0.06	0.07	-0.08	0.02	0.03	**-0.24**	**-0.32**						
15	*BTM*	0.06	**-0.12**	**-0.15**	**-0.09**	0.01	-0.04	**-0.09**	**-0.22**	0.05	**-0.14**	-0.04	**0.11**	**-0.46**	**-0.49**	0.07					
16	*INTANG*	**-0.12**	**0.23**	**0.23**	0.08	0.00	0.04	-0.01	0.07	-0.05	-0.05	**-0.36**	**-0.18**	0.08	-0.05	**0.13**	0.08				
17	*NO INTANG*	**0.09**	-0.04	-0.06	**0.12**	-0.01	0.04	0.03	0.06	0.06	-0.03	0.06	**0.19**	**-0.20**	0.03	**0.15**	0.05	-0.02			
18	*CAP INTENSITY*	**0.16**	**-0.13**	-0.06	-0.07	-0.01	-0.04	-0.07	0.05	0.07	-0.04	0.06	**0.09**	0.00	-0.04	**0.21**	-0.02	**-0.43**	**0.20**		
19	*RAISE CAP*	0.08	**0.09**	**0.12**	**0.09**	-0.04	0.01	0.05	-0.02	**-0.22**	**0.14**	-0.07	-0.03	**0.10**	0.05	0.00	0.02	**0.09**	-0.03	0.02	
20	*LOSS*	0.00	**-0.09**	**-0.17**	0.00	-0.02	-0.04	0.01	**-0.20**	**0.12**	**-0.19**	**0.20**	0.05	**-0.36**	**-0.52**	**0.16**	**0.29**	**-0.17**	-0.03	**0.09**	**-0.11**

Table 2: Continued

Panel C: Pearson Correlation Coefficients (Tax Avoidance Tests)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	ETR																		
1	*CASH ETR*	**0.78**																	
2	*WB*	0.04	0.03																
3	*POST*	0.04	**0.09**	0.01															
4	*WB * POST*	0.05	0.08	**0.33**	**0.68**														
5	*PRESS*	0.01	0.02	**0.24**	0.01	**0.09**													
6	*SIZE*	**-0.12**	**-0.09**	**0.19**	0.01	0.06	**0.16**												
7	*ROA*	0.07	-0.02	0.02	0.01	0.04	**0.10**	0.07											
8	*LEVERAGE*	-0.05	0.07	**0.20**	-0.01	0.05	**-0.11**	0.02	**-0.32**										
9	*FOREIGN INC*	-0.08	**-0.14**	-0.02	0.01	0.00	**0.13**	**0.12**	-0.05	**-0.14**									
10	*CAP INTENSITY*	-0.03	**0.11**	-0.07	-0.01	-0.04	-0.07	**0.09**	-0.04	**0.21**	**-0.43**								
11	*BIG 4*	-0.07	-0.01	**0.10**	-0.05	0.03	0.02	**0.19**	**0.12**	0.06	-0.07	0.05							
12	*RD*	-0.03	**-0.14**	0.06	0.01	0.02	**0.18**	0.01	0.01	**-0.29**	**0.39**	**-0.27**	**-0.13**						
13	*INTANG*	**-0.09**	**-0.10**	0.08	0.00	0.04	-0.01	**0.09**	-0.05	**0.13**	**0.17**	**-0.43**	0.07	-0.02					
14	*BTM*	-0.03	-0.04	**-0.09**	0.01	-0.04	**-0.09**	**-0.17**	**-0.49**	0.07	**-0.09**	-0.02	**-0.22**	**-0.15**	0.08				
15	*SALES GROWTH*	0.02	-0.04	0.02	**-0.11**	-0.03	-0.02	-0.04	**0.28**	-0.06	-0.05	0.03	-0.02	-0.02	0.06	-0.08			
16	*CASH*	0.02	-0.07	**-0.10**	0.02	-0.04	**0.17**	**-0.23**	**0.20**	**-0.44**	**0.15**	**-0.25**	-0.08	**0.60**	**-0.25**	-0.06	0.05		
17	*NOL*	**-0.09**	-0.07	0.01	0.02	0.02	**0.11**	-0.08	**-0.29**	0.07	**0.28**	**-0.17**	-0.07	0.08	**0.12**	**0.14**	**0.09**	0.05	
18	*ΔNOL*	0.06	0.04	0.04	-0.03	0.01	**0.10**	0.07	-0.05	**0.11**	-0.01	-0.01	0.07	-0.04	**0.12**	-0.03	0.00	-0.07	**0.09**

Significant coefficients (p-value < 0.05) are in bold. Model variables are defined in the Appendix.

Table 3

Covariate Balance between Treatment (WB)

and Control (non-WB) Groups in Match Year

Variable	Difference in Means	Difference in Medians	Difference in Distributions*
	(*p*-values)	(*p*-values)	(*p*-values)
CM_PRESSURE	0.521	0.570	0.931
GROWTH	0.786	0.780	0.688
PAST_PERF	0.547	0.557	0.902
REPUTATION	0.936	0.939	1.000
COMMUNICATION	0.998	0.901	0.631
DOWNSIZE	0.872	0.936	0.697
QUITAM	0.650	0.651	1.000
SIZE	0.649	0.269	0.316
ICW	0.945	0.865	0.994

Tests of differences in means (*t*-tests), medians (Wilcoxon rank-sum tests), and distributions (Kolmogorov-Smirnov homogenous distributions tests) of matching variables (following Bowen et al. 2010) in the match year (i.e., the year prior to the whistleblowing allegations for *WB* firms and for control firms, the year prior to the year control firm's matched treatment firm was subject to the whistleblowing allegations).

Table 4

Whistleblowing Allegations and Subsequent Financial Reporting Aggressiveness (test of H1)

		Changes: Full Sample Period						**Time Series**					
		(1) Coef (*p*-value)		(2) Coef (*p*-value)		(3) Coef (*p*-value)		(4) Coef (*p*-value)		(5) Coef (*p*-value)		(6) Coef (*p*-value)	
	Pred.	*ΔAQ*	*Std Coef.*	*ΔACCT RISK*	*Std Coef.*	*ΔAGR*	*Std Coef.*	*AQ*	*Std Coef.*	*ACCT RISK*	*Std Coef.*	*AGR*	*Std Coef.*
WB		-0.002	-0.016	5.558**	0.201	0.436	0.016						
		(0.882)		(0.025)		(0.856)							
POST		0.006	0.051	12.81**	0.463	4.094	0.153	**-0.005**	-0.091	**-5.696****	**-0.236**	**-6.698****	**-0.278**
		(0.724)		(0.016)		(0.464)		**(0.249)**		**(0.045)**		**(0.015)**	
WB * POST	**-**	**-0.011**	-0.086	**-24.40*****	**-0.882**	**-12.87****	**-0.481**						
		(0.294)		**(0.000)**		**(0.039)**							
PRESS		0.016	0.131	-3.102	-0.112	-5.262	-0.197	0.015	0.266	-10.97	-0.454	-16.49*	-0.685
		(0.140)		(0.637)		(0.243)		(0.217)		(0.147)		(0.052)	
ΔAUDITOR		-0.104	-0.836	-4.032	-0.146	-11.02	-0.412	-0.042*	-0.717	-15.84	-0.656	-27.82	-1.156
		(0.221)		(0.687)		(0.338)		(0.099)		(0.407)		(0.255)	
TENURE								0.001**	0.015	-0.212	-0.089	-0.545**	-0.230
								(0.024)		(0.383)		(0.020)	
ΔSTD CFO		0.025	0.004	105.1*	0.083	106.5*	0.087	-0.133	-0.083	108.6	0.164	89.54*	0.136
		(0.915)		(0.098)		(0.093)		(0.461)		(0.136)		(0.090)	
ΔSTD SALE		-0.062	-0.046	37.29**	0.130	26.37	0.095	-0.149**	-0.294	56.40**	0.254	34.70**	0.157
		(0.353)		(0.047)		(0.154)		(0.014)		(0.012)		(0.050)	
ΔLN MVE		-0.004	-0.015	6.582	0.106	2.168	0.036	-0.008**	-0.239	5.739***	0.421	6.861***	0.506
		(0.814)		(0.226)		(0.690)		(0.013)		(0.001)		(0.000)	
ΔROA		0.061	0.035	-2.083	-0.006	-6.856	-0.019	0.058	0.103	-32.72	-0.135	-10.27	-0.043
		(0.224)		(0.945)		(0.815)		(0.312)		(0.205)		(0.676)	
ΔLEVERAGE		0.218**	0.108	40.71	0.095	39.16	0.095	0.084***	0.250	6.066	0.042	33.36**	0.232
		(0.016)		(0.102)		(0.167)		(0.005)		(0.642)		(0.014)	
ΔBTM		0.019	0.029	6.410	0.046	-1.588	-0.012	0.017	0.082	8.654	0.096	11.62	0.129
		(0.587)		(0.503)		(0.865)		(0.366)		(0.440)		(0.270)	
ΔINTANG		-0.072	-0.032	119.1***	0.238	104.2***	0.216	-0.037*	-0.119	19.36	0.147	14.68	0.112
		(0.345)		-0.000		(0.000)		(0.093)		(0.115)		(0.256)	
NO INTANG								0.018*	0.317	1.178	0.049	3.043	0.127
								(0.068)		(0.813)		(0.561)	
ΔCAP INTENSITY		0.069	0.018	-63.45	-0.078	-12.26	-0.016	0.036	0.097	-26.98	-0.180	-30.33*	-0.203
		(0.738)		(0.165)		(0.772)		(0.404)		(0.135)		(0.087)	
ΔRAISE CAP		0.014	0.110	12.53*	0.453	9.979	0.373	0.053	0.916	-4.359	-0.180	3.238	0.135
		(0.858)		(0.090)		(0.438)		(0.171)		(0.731)		(0.878)	
ΔLOSS		-0.021	-0.169	9.335*	0.337	3.640	0.136	-0.020	-0.337	-3.045	-0.126	-7.159	-0.298
		(0.233)		(0.091)		(0.527)		(0.299)		(0.645)		(0.261)	
Constant		-0.007		-3.723**		0.003		-0.043		23.61		14.22	
		(0.503)		(0.040)		(0.999)		(0.395)		(0.232)		(0.517)	

Table 4: Continued

	(1)		(2)	(3)	(4)		(5)	(6)
	ΔAQ		*ΔACCT RISK*	*ΔAGR*	*AQ*		*ACCT RISK*	*AGR*
Observations	459		341	341	271		239	239
Adj. R-squared	0.004	-0.016	0.133	0.079	0.209	-0.091	0.355	0.404

*, **, *** represent significance at the .10, .05, and .01 levels, respectively (two-tailed tests; one-tailed tests if prediction is made and sign is consistent with prediction). Note that time series tests include only those firms that are subject to whistleblowing allegations during the sample period and the prediction applies to the coefficient on *POST* rather than *WB*POST*. In columns (5) and (6), the coefficient on *ΔAUDITOR* is omitted due to lack of variation in changes in firms' use of their independent auditor. In all columns, the coefficient on *ΔBig 4* is omitted due to lack of variation in use of a Big 4 auditor among *WB* firms in the sample. *Std Coef.* columns report standardized coefficients, which reflect the standard deviation change in the dependent variable associated a change from 0 to 1 for binary variables and the standard deviation change in the dependent variable for a standard deviation change in the independent variable (for continuous variables). Variables are defined in the Appendix. Time series models include industry (two-digit SIC code) and year fixed effects, with standard errors clustered by firm (Gow et al. 2010; Petersen 2009). The changes model removes industry and year effects. However, results

Table 4: Continued

are qualitatively similar (same sign and significance) in all tests if I include industry and year fixed effects (i.e., if I do not difference out the fixed effects). I winsorize continuous variables at the 1st and 99th percentiles.

Table 5

Whistleblowing Allegations and Firms' Subsequent Tax Avoidance (test of H2)

		Changes: Full Sample Period						Time Series	
		(1)		(2)		(3)		(4)	
		Coef		Coef		Coef		Coef	
		(*p*-value)		(*p*-value)		(*p*-value)		(*p*-value)	
	Prediction	*ΔETR*	*Std Coef.*	*ΔCASH ETR*	*Std Coef.*	*ETR*	*Std Coef.*	*CASH ETR*	*Std Coef.*
WB		-0.019	-0.147	-0.018	-0.117				
		(0.125)		(0.251)					
POST		-0.011	-0.088	0.005	0.035	**0.035***	0.192	**0.043****	0.219
		(0.603)		(0.797)		**(0.064)**		**(0.049)**	
WB * POST	+	**0.051****	0.398	**0.063****	0.422				
		(0.039)		**(0.018)**					
PRESS		-0.020	-0.161	-0.007	-0.046	0.054	0.311	0.062	0.326
		(0.543)		(0.837)		(0.120)		(0.105)	
ΔSIZE		0.066	0.087	0.109	0.122	-0.028	-0.254	-0.024	-0.200
		(0.391)		(0.127)		(0.202)		(0.237)	
ΔROA		-0.070	-0.039	-0.216	-0.103	-0.165	-0.098	-0.225	-0.122
		(0.639)		(0.235)		(0.509)		(0.376)	
ΔLEVERAGE		-0.259**	-0.125	-0.409***	-0.167	0.044	0.043	-0.023	-0.021
		(0.012)		(0.002)		(0.724)		(0.882)	
ΔFOREIGN INC		-0.015	-0.120	-0.025	-0.167	0.096**	0.553	0.084**	0.441
		(0.563)		(0.389)		(0.025)		(0.035)	
ΔCAP INTENSITY		-0.517	-0.131	-0.574	-0.124	-0.202	-0.181	-0.082	-0.067
		(0.103)		(0.113)		(0.310)		(0.699)	
ΔR&D		1.241	0.105	1.687	0.121	0.562	0.210	0.400	0.137
		(0.339)		(0.271)		(0.195)		(0.339)	
ΔINTANG		-0.172	-0.076	-0.078	-0.029	-0.199	-0.211	-0.121	-0.117
		(0.266)		(0.675)		(0.211)		(0.479)	
ΔBTM		-0.048	-0.071	-0.101**	-0.127	0.003	0.005	0.045	0.065
		(0.275)		(0.028)		(0.971)		(0.632)	
SALES GROWTH		0.030	0.034	0.035	0.034	0.077	0.067	-0.015	-0.012
		(0.687)		(0.544)		(0.640)		(0.934)	
ΔCASH		-0.040	-0.019	-0.024	-0.010	-0.449**	-0.362	-0.361*	-0.266
		(0.627)		(0.785)		(0.014)		(0.068)	
NOL						-0.095***	-0.542	-0.074**	-0.386
						(0.003)		(0.019)	
ΔNOL		-0.321*	-0.083	-0.387	-0.085	0.546*	0.123	0.228	0.047
		(0.083)		(0.104)		(0.065)		(0.372)	
Constant		-0.008		-0.013		0.626***		0.557***	
		(0.320)		(0.287)		(0.000)		(0.002)	
Observations		451		451		271		271	
Adj. R-squared		0.045		0.079		0.240		0.211	

Table 5: Continued

*, **, *** represent significance at the .10, .05, and .01 levels, respectively (two-tailed tests; one-tailed tests if prediction is made and sign is consistent with prediction). Note that time series tests include only those firms that are subject to whistleblowing allegations during the sample period and the prediction applies to the coefficient on *POST* rather than *WB*POST*. For the time series tests, the coefficient on *Big 4* is omitted due to lack of variation in use of a Big 4 auditor among *WB* firms in the sample. *Std Coef.* columns report standardized coefficients, which reflect the standard deviation change in the dependent variable associated a change from 0 to 1 for binary variables and the standard deviation change in the dependent variable for a standard deviation change in the independent variable (for continuous variables). Variables are defined in the Appendix. Time series models include industry (two-digit SIC code) and year fixed effects, with standard errors clustered by firm (Gow et al. 2010; Petersen 2009). The changes model removes industry and year effects. However, results are qualitatively similar (same sign and significance) in all tests if I include industry and year fixed effects (i.e., if I do not difference out the fixed effects). I winsorize continuous variables at the 1st and 99th percentiles.

Table 6

First-stage Selection Model (Probability of Engaging Auditor for Tax Services):

Whistleblowing Allegations and Firms' Subsequent Investments in Tax Services

	PROBIT	
	TAXAUD	
	Coefficient	(*p*-value)
WB	-0.071	(0.568)
POST	-0.102	(0.165)
*WB * POST*	0.109	(0.216)
PRESS	0.150	(0.275)
INST OWN	0.243**	(0.029)
AUD IND	-0.079	(0.511)
TENURE	0.234	(0.111)
ΔAUDITOR	-0.043	(0.488)
LN AUDIT FEES	0.361*	(0.066)
BIG 4	-0.036	(0.729)
MERGER	0.026	(0.796)
AQ	-0.225	(0.683)
SIZE	0.140	(0.415)
ROA	-0.045	(0.731)
LEVERAGE	-0.041	(0.762)
FOREIGN INC	0.221	(0.128)
CAP INTENSITY	-0.059	(0.693)
R&D	-0.002	(0.991)
INTANG	0.129	(0.377)
BTM	-0.135	(0.366)
SALES GROWTH	-0.117	(0.198)
CASH	-0.193	(0.190)
NOL	0.033	(0.770)
ΔNOL	-0.099	(0.336)
Constant	0.108	(0.941)
Observations	542	
Area under ROC Curve	0.833	
Hosmer and Lemeshow	0.162	
Pseudo R-squared	0.271	

Table 6: Continued

*, **, *** represent significance at the .10, .05, and .01 levels, respectively (two-tailed tests). Variables are defined in the Appendix. All models include industry (two-digit SIC code) and year fixed effects, with standard errors clustered by firm (Gow et al. 2010; Petersen 2009). I winsorize continuous variables at the 1st and 99th percentiles. Model variables are standardized (scaled by their standard deviations) for presentation (i.e., unstandardized variables have multiple leading zeroes right of the decimal).

Table 7

Outcome Model (test of H3):

Whistleblowing Allegations and Firms' Subsequent Investments in Tax Services

	OLS	
	TAX FEES	
	Coefficient	(*p*-value)
WB	-0.091	(0.425)
POST	0.059	(0.142)
WB * POST	**-0.089****	**(0.037)**
PRESS	-0.056	(0.576)
INST OWN	0.127	(0.217)
BIG 4	0.071	(0.141)
MERGER	0.021	(0.789)
AQ	0.201	(0.513)
SIZE	-0.151	(0.159)
ROA	0.251**	(0.026)
LEVERAGE	0.147	(0.261)
FOREIGN INC	0.336***	(0.004)
CAP INTENSITY	0.042	(0.685)
R&D	0.060	(0.736)
INTANG	0.149	(0.412)
BTM	-0.017	(0.854)
SALES GROWTH	-0.183**	(0.012)
CASH	-0.118	(0.416)
NOL	0.104	(0.264)
ΔNOL	0.066	(0.211)
Constant	-0.593	(0.518)
INV MILLS	0.669	(0.138)
Observations	356	
Adjusted R-squared	0.326	

Table 7: Continued

*, **, *** represent significance at the .10, .05, and .01 levels, respectively (two-tailed tests). Variables are defined in the Appendix. All models include industry (two-digit SIC code) and year fixed effects, with standard errors clustered by firm (Gow et al. 2010; Petersen 2009). I winsorize continuous variables at the 1st and 99th percentiles. Model variables are standardized (scaled by their standard deviations) for presentation (i.e., unstandardized variables have multiple leading zeroes right of the decimal). The results are qualitatively similar (coefficient on *WB*POST* is negative and significant, $p < 0.05$) using unstandardized variables.

Table 8

Financial Reporting: Difference-in-difference Estimates Limited to Periods t to t+1

	Prediction	(1) Coef (*p*-value) *ΔAQ*	(2) Coef (*p*-value) *ΔACCT RISK*	(3) Coef (*p*-value) *ΔAGR*
WB	-	0.009	-16.59***	-9.531*
		(0.529)	(0.005)	(0.082)
PRESS		0.004	1.206	-4.983
		(0.911)	(0.930)	(0.697)
SALES GROWTH		-0.016	-2.965	-1.196
		(0.784)	(0.906)	(0.964)
ΔSTD CFO		-0.306	196.4	63.22
		(0.521)	(0.113)	(0.656)
ΔSTD SALE		-0.076	2.290	-9.455
		(0.315)	(0.932)	(0.779)
ΔLN MVE		0.057*	25.22***	17.36*
		(0.051)	(0.001)	(0.069)
ΔROA		0.098	-82.40**	-33.78
		(0.413)	(0.034)	(0.432)
ΔLEVERAGE		0.422***	55.74	82.65*
		(0.002)	(0.259)	(0.078)
ΔBTM		0.079*	44.70**	35.81*
		(0.088)	(0.014)	(0.054)
ΔINTANG		0.026	111.1*	63.83
		(0.846)	(0.064)	(0.296)
ΔCAP INTENSITY		-0.086	113.2	181.2*
		(0.673)	(0.214)	(0.057)
ΔRAISE CAP		0.077***	-31.11***	-29.30*
		(0.001)	(0.003)	(0.054)
ΔLOSS		-0.022	3.115	5.720
		(0.463)	(0.844)	(0.639)
Constant		-0.011	5.471	0.302
		(0.292)	(0.229)	(0.950)
Observations		81	81	81
Adj. R-squared		0.162	0.207	0.078

Table 8: Continued

*, **, *** represent significance at the .10, .05, and .01 levels, respectively (two-tailed tests; one-tailed tests if prediction is made and sign is consistent with prediction). Financial reporting responses to employee whistleblowing allegations—results of tests of difference-in-difference estimates for periods t to t+1, exclusively. Variables are defined in the Appendix. The changes model removes industry and year effects. I winsorize continuous variables at the 1st and 99th percentiles.